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Analysis of Integrated Bus Terminal Services and Their Impact on Customer Satisfaction at Pulo Gebang

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Abstract

Purpose: This study aims to analyze the service level of the Pulo Gebang Integrated bus terminal in increasing customer satisfaction.
Research Methodology: The study uses a descriptive quantitative approach based on Creswell's stages, with data collected through observations, surveys, and interviews at the Pulo Gebang Integrated Bus Terminal. Data were analyzed using SERVQUAL, Importance Performance Analysis (IPA), and Quality Function Deployment (QFD) to evaluate service quality and determine improvement priorities.
Results: Based on the analysis and discussion, the results of the gap analysis between customer perceptions and expectations of 22 service attributes are all negative (-) with a range of -0.15 to -1,49. This indicates that the quality of service is still far from customer expectations, the attributes of interest after analyzing with the Importance Performance Analysis, the priority for improvement is obtained as well as in an effort to improve the quality of customer service at the Pulo Gebang Integrated bus terminal, after analyzing the approach with the Quality Function Deployment method, seven order of priority improvement.
Conclusions: All service attributes show negative gaps, indicating unmet customer expectations. Priority improvements focus on key aspects such as timeliness, access, comfort, staff competence, security, facilities, and cleanliness.
Limitations: This study is limited to a single terminal and short-term survey data, which may not fully represent broader conditions or long-term trends.
Contributions: This study provides an integrated evaluation of service quality using SERVQUAL, IPA, and QFD, and identifies priority improvements to enhance customer satisfaction.

Keywords: *Customer Satisfaction, IPA, Service, Servqual, QFD*

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1. Introduction

DKI Jakarta Province has experienced many rapid developments in all fields due to being one of the Metropolitan Cities. These factors have resulted in the increasing flow of mobility to the DKI Jakarta Province. The large flow of mobility to the DKI Jakarta Province must of course be supported by good facilities and infrastructure so as not to cause problems that have an impact on the effectiveness of transportation (Aritenang, 2021; Hidayati et al., 2019; Mukti & Prambudia, 2018; Yudhistira et al., 2019).

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The Pulo Gebang Integrated bus terminal with a land area of 12.6 H and a building area of 5.4 H is an Integrated Terminal which can be said to be similar to an airport, only simpler. So that it is one of the potentials to become a land gate in DKI Jakarta. This cannot be separated from the vital role of replacing two major terminals in Jakarta, namely Pulo Gadung and Rawamangun Terminals. It is hoped that the Pulo Gebang Integrated bus terminal will attract the interest of investors so that the wheels of the economy in DKI Jakarta in general and in the East Jakarta area in particular will be more stretched (Krisantinus et al., 2021).

The DKI Jakarta Provincial Government has not yet maximally improved the Pulo Gebang Integrated bus terminal, both in terms of facilities and services. This is reflected in the presence of passengers and drivers who have not maximized using the Pulo Gebang Integrated bus terminal (Agustina et al., 2021; Ferza et al., 2019; Hasbiyalloh & Masya, 2018). It can be seen from the recapitulation of the number of bus arrivals and passengers for the 2016-2019 period:

Table 1. Recapitulation of Number of Bus Arrivals and Passengers at the Pulo Gebang Integrated bus terminal for the 2016-2019 period

Month	Year							
	2016		2017		2018		2019	
	Bus	Pax	Bus	Pax	Bus	Pax	Bus	Pax
January	-	-	5.461	88420	6.757	101.148	3.290	44.646
February	-	-	7.586	110.785	5.001	59.649	2.329	31.577
March	-	-	8.531	121.722	5.456	64.202	2.294	36.466
April	-	-	7.980	111.931	5.324	65.877	3.257	13.22
May	-	-	7.466	103.866	4.125	58.509	2.794	32.900
June	-	-	5.542	96.729	4.752	76.589	6.007	77.257
July	2.646	56.187	10.509	211.640	5.409	82.267	4.148	68.292
August	3.789	52.708	6.479	80.506	4.165	44.410	3.909	56.554
September	4.307	60.112	7.213	110.618	3.820	47.841	3.567	50.968
October	3.221	49.198	5.926	77.293	3.557	44.074	3.677	48.925
November	3.033	42.557	5.259	66.321	3.090	38.106	3.923	50.192
December	3.756	56.087	7.466	103.866	3.370	47.276	4.903	62.129
Jumlah	20.752	316.849	85.418	1.283.697	54.826	729.948	44.098	561.228

Based on the table above shows the increase and decrease of buses and passengers during the period 2016-2019, where passengers from 2018 amounted to 729,948 passengers to 561,228 passengers in 2019. In addition, according to the Jakarta City Transportation Council (DTKJ), there are many shadow terminals around Pulo Gebang arises because the position of the terminal is considered not strategic. Pulo Gebang Terminal governance must be improved, because until now, the largest terminal in Jakarta, is still not optimal. If this is not immediately addressed, it is not impossible that the Pulo Gebang Integrated bus Terminal will be abandoned by Service Users (Angco, 2021; Diharjo, 2018; Hardiono & Harsasto, 2018; Sakti, 2020).

Seeing the above conditions, it needs to be done in an effort to revive the Pulo Gebang Integrated bus Terminal, which is empty of passengers. Supranto (2016) states that, one way to measure people's attitudes towards the service quality of a service is to use a questionnaire regarding the level of satisfaction and the level of performance of these services (Al Kurdi et al., 2020; Hamzah & Shamsudin, 2020; Otto et al., 2020). Furthermore, to answer the formulation of the problem regarding the extent to which the level of service user satisfaction with the performance of service servants, the authors use the Importance

Performance Analysis (IPA) method or Analysis of the Level of Interest and Performance /customer satisfaction as well as Quality Function Deployment (QFD) (Caesaron et al., 2021; Ochwo & Mwesigwa, 2021; Rifai et al., 2021).

Based on the research gap conducted by previous research, the quality of the service of the West Cross West Local Economy Train is at a moderate level which indicates that the quality expected by customers has not been fulfilled (Alam & Mondal, 2019). There are 21 indicators that can describe the dimensions of service quality with indicators related to the readiness of officers in directing the ladder of assistance from the platform to the train door which has the highest level of dissatisfaction (Ok et al., 2018; Putri et al., 2017). The recommended improvements that are a priority based on the results of the QFD analysis are to increase the supervision of the implementation of the SOP by the officers. In line with the research results of Saffan et al. (2018) where the results of the Cartesian diagram were processed with the House of Quality in QFD. The results of the SERVQUAL and QFD analysis show that five (5) main priorities are in the effort to increase customer satisfaction in Teluk Lamong Terminal, including: 1). evaluate the SOP of the behandle process; 2) adding personnel to TKBM officers at the location of the behandle; 3). provide special training for officers at behandle locations; 4). Trying to establish a communication network with Customs, if service users experience problems in NPE management; and 5). Upgrade forklift units if needed (Kayapınar & Erginel, 2019).

The objectives of this study are 1) To find out whether it meets the expectations of service users based on the gap value of the indicators of customer expectations or desires on the perceptions of the operational service quality of the Pulo Gebang Integrated bus terminal with the Service Quality (SERVQUAL) method; 2) To find out what service attributes are in quadrant one for program priority with the Importance Performance Analysis method: 3) To find out how the technical recommendations for redesigning the service operation of the Pulo Gebang Integrated bus terminal in increasing customer satisfaction with the QFD method (Sukwadi et al., 2021).

2. Literature Review & Hypothesis Development

2.1 Service Quality and Customer Satisfaction

The concept of service quality has been widely studied in various fields, particularly in public transportation. The SERVQUAL model, which measures the gap between customer expectations and perceptions. The model evaluates service quality through five key dimensions: tangibles, reliability, responsiveness, assurance, and empathy. SERVQUAL has been extensively applied to measure service quality in sectors like bus terminals, railway stations, and airports (Zehmed & Jawab, 2020).

2.2 Importance Performance Analysis (IPA)

Importance Performance Analysis (IPA) is another widely used tool for evaluating service quality. IPA measures the performance of various service attributes in relation to their importance to customers. This method categorizes service attributes into four quadrants based on their importance and performance, helping to identify areas that need improvement (Siddique & Basak, 2018).

For instance, Putri et al. (2017) applied IPA to analyze service quality at West Cross West Local Economy Train, highlighting service reliability and customer engagement as key areas for improvement. Similarly, in the context of Pulo Gebang Integrated Bus Terminal, IPA can identify crucial service attributes such as punctuality, terminal cleanliness, and staff responsiveness that need to be prioritized for improvement.

2.3 Quality Function Deployment (QFD)

Quality Function Deployment (QFD) is a method used to translate customer needs into service specifications and technical requirements. QFD helps align customer expectations with service attributes and is a

powerful tool in service improvement processes (Erdil & Arani, 2019).

Wedagama et al. (2020) used QFD to improve the service quality of Bus Trans Sarbagita, focusing on attributes such as punctuality and customer service training. The Pulo Gebang Integrated Bus Terminal can also benefit from QFD by analyzing customer feedback and prioritizing improvements in attributes such as security, facility cleanliness, and bus scheduling.

2.4 Service Improvement in Bus Terminals

Improving service in bus terminals is essential to meet the growing demand for efficient public transportation systems. According to the Jakarta City Transportation Council (DTKJ), Pulo Gebang Terminal faces challenges related to its location and inadequate facilities, affecting customer satisfaction. Ghozali (2011) highlights the role of terminal infrastructure and customer interaction points in improving user satisfaction. Additionally, Rangkuti (2012) suggests that improving customer service attributes such as ticketing efficiency, cleanliness, and staff behavior significantly boosts customer satisfaction. The Pulo Gebang Terminal, therefore, needs to enhance its service offerings in these areas to better meet customer expectations.

2.5 Hypothesis Development

Based on the literature reviewed above, the following hypotheses are proposed:

- H_1: Service quality at the Pulo Gebang Integrated Bus Terminal has a significant impact on customer satisfaction.
- H_2: Punctuality and reliability of the bus services are the most important factors affecting customer satisfaction at the Pulo Gebang Integrated Bus Terminal.
- H_3: Improving the cleanliness and comfort of terminal facilities will significantly enhance customer satisfaction at the Pulo Gebang Integrated Bus Terminal.

3. Methodology

This study employs a combination of Descriptive Analysis, SERVQUAL Gap Analysis, Importance Performance Analysis (IPA), and Quality Function Deployment (QFD) methods. Descriptive analysis is used to summarize data characteristics, while SERVQUAL is applied to measure the gap between customer expectations and perceived service performance. Furthermore, IPA is utilized to identify priority service attributes based on importance and performance levels. Finally, QFD is used to translate customer needs into technical improvements and determine priority actions to enhance service quality.

4. Methods

4.1 Research Design

This study adopts a descriptive quantitative approach to evaluate service quality at the Pulo Gebang Integrated Bus Terminal. The research design consists of several stages, including planning, implementation, and evaluation.

In the planning stage, a preliminary survey was conducted through literature review, consultations with practitioners, and discussions with supervisors. This was followed by problem identification to determine specific research topics and goal setting to define the objectives of the study.

The implementation stage involves direct observation and field surveys, where the researcher acts as the main instrument in collecting and interpreting data. The study is designed as a case study, meaning the findings are specific to the observed location.

4.2 Data Collection

Data collection in this study consists of both primary and secondary data. Primary data were obtained through direct observation, field surveys, questionnaires, and interviews with relevant stakeholders. These include data on the number of buses, number of passengers, and actual service conditions at the Pulo Gebang Integrated Bus Terminal. Secondary data were collected from related institutions and existing reports to support the primary data. The combination of these data sources ensures a comprehensive understanding of the service performance and customer satisfaction levels.

4.3 Data Analysis

The data analysis process includes data processing, comparison, evaluation, and the application of several analytical methods. The collected data were first processed and organized from observations, surveys, and interviews. Then, analysis was conducted to determine customer satisfaction levels and service performance.

Several methods were applied in this study:

- Descriptive Analysis: Used to describe data characteristics and compare mean values with standard deviations.
- SERVQUAL Gap Analysis: Used to measure the gap between customer expectations and perceived service quality using the formula $Q = P - E$.
- Importance Performance Analysis (IPA): Used to classify service attributes into four quadrants based on importance and performance levels.
- Quality Function Deployment (QFD): Used to develop improvement priorities through the House of Quality.

The final stage involves evaluation and formulation of recommendations to improve service quality and enhance customer satisfaction at the terminal.

5. Results and Discussion

Based on the analysis obtained using the IPA method, the following results were obtained:

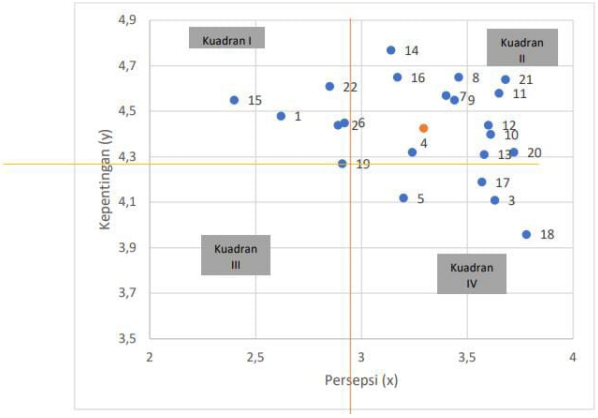

Figure 1. Natural Sciences Cartesian Diagram

Quadrant I (Top Priority)

In quadrant one, this is the quadrant that is the top priority or the most important for improvement. Because it has a high value of importance but the performance is still lacking. The attributes that exist in

this quadrant are:

- Punctuality of departure and arrival (1)
- Access to the terminal location (2)
- Quietness and comfort of the terminal (6)
- Knowledge and skills of terminal officers in dealing with passenger complaints (14)
- Guarantee of security and trust in service (15)
- Convenience of existing facilities in the terminal (16)
- Cleanliness and tidiness of buses and terminal staff (22)

Quadrant II (Maintain Achievement)

This second quadrant is a quadrant that can be said to be quite good. Where the importance is high and supported by high performance as well. Thus customers feel satisfied with the services provided. The following are attributes that are included in quadrant 2:

- Officers are fast and responsive in serving (7)
- Responsive officers in helping customers (8)
- Ease of obtaining information (9)
- Honesty of officers in serving customers (11)
- Polite and friendly ticket service (12)
- Cleanliness in the terminal (21)

Quadrant III (Low Priority)

This third quadrant is a quadrant that is considered less important by customers, as well as their performance that is not given much attention. Some of the attributes that fall into this 3rd quadrant are:

- The correct temperature of the air inside the terminal (4)
- Suitability of the tariff with the services provided (5)
- Give individual attention to passengers and people with disabilities (19)

Quadrant IV (Excessive)

Attributes that enter this quadrant are said to be excessive due to excessive performance, while the importance for this attribute is low. The following attributes fall into quadrant 4:

- Friendly staff in serving customers (3)
- Easy access to bus tickets at the terminal (10)
- Cleanliness in the terminal area (13)
- Availability of ticketing and payment counters (17)
- Tidiness of officers in uniform (18)
- Has public facilities and good lighting (20)

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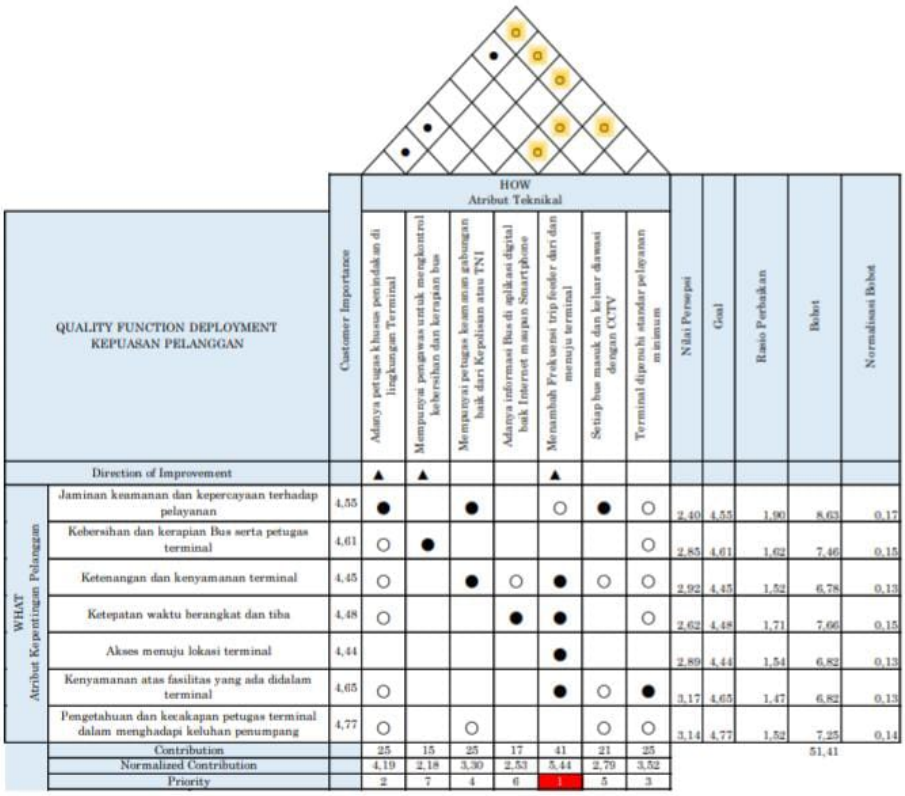

Figure 2. Home Quality Matrix

The value of importance weight on the quality house matrix shows that increasing the frequency of the feeder trip to and from the bus terminal has the highest weight. Based on the analysis and discussion where the interests and expectations of customers for the Integrated Pulo Gebang Bus Terminal services from the implementation of Service Quality Integration and Importance Performance Analysis in the Quality Function Deployment are described as follows:

1) The results of the gap analysis between perceptions and customer expectations of 22 service attributes are all negative (-) with a range of -0.15 to -1.49. This indicates that the quality of service is still far from customer expectations.
2) Attributes of importance and performance after analyzing the Importance Performance Analysis according to the Cartesian diagram, are as follows:
   (a) Quadrant I
      - Punctuality of departure and arrival (1)
      - Access to the terminal location (2)
      - Quietness and comfort of the terminal (6)
      - Knowledge and skills of terminal officers in dealing with passenger complaints (14)
      - Guarantee of security and trust in service (15)
      - Convenience of existing facilities in the terminal (16)
      - Cleanliness and tidiness of buses and terminal staff (22)
   (b) Quadrant II
      - Officers are fast and responsive in serving (7)
      - Responsive officers in helping customers (8)
      - Ease of obtaining information (9)

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- Honesty of officers in serving customers (11)
- Polite and friendly ticket service (12)
- Cleanliness in the terminal (21)

(c) Quadrant III
- The correct temperature of the air inside the terminal (4)
- Suitability of the tariff with the services provided (5)
- Give individual attention to passengers and people with disabilities (19)

(d) Quadrant IV
- Friendly staff in serving customers (3)
- Easy access to bus tickets at the terminal (10)
- Cleanliness in the terminal area (13)
- Availability of ticketing and payment counters (17)
- Tidiness of officers in uniform (18)
- Has public facilities and good lighting (20)

3) In an effort to improve the quality of customer service at the Pulo Gebang Integrated Bus Terminal, after analyzing the approach with the Quality Function Deployment method, the following order of priority improvements is obtained:

- Increase the frequency of the feeder trip to and from the terminal
- There is a special officer for enforcement in the Terminal environment
- The terminal meets minimum service standards
- Has a joint security officer from either the Police or the TNI
- Every bus in and out is monitored by CCTV
- The existence of Bus information in digital applications, both Internet and Smartphones

Has a supervisor to control the cleanliness and tidiness of the bus.

Based on the research gap conducted by previous research conducted by Putri et al. (2017) with the results of research on the quality of service of the West Cross West Local Economic Train, including at a moderate level which shows the quality expected by customers has not been met (Putri et al., 2017).

IPA analysis shows that almost all service attributes need to be improved (Phadermrod et al., 2019), for the level of user satisfaction with the service obtained from the results of the analysis using the CSI method, where currently the level of user satisfaction with the Trans Sarbagita Bus service is the attention of service personnel in treating passengers professionally, the punctuality of the Trans Sarbagita Bus departure time and the suitability between service hours and the time needed by the community (Wedagama et al., 2020).

The results of data analysis using the Servqual method show that the results of data analysis show that there are 6 attributes that must be improved and in the QFD method, the results of data analysis obtained from the House Of Quality (HOQ) matrix indicate the application of culture 4S with the highest weight value from 113.13, planning In customer satisfaction strategy, the priority that must be implemented by the company is to implement the 4S culture (Smile, Greetings, Greetings, Poles) (Alfatiyah & Apriyanto, 2019).

6. Conclusions

Based on the analysis of the service level of the integrated bus terminal Pulo Gebang in increasing customer satisfaction with servqual and IPA in QFD as described in the previous chapters, the following

conclusions can be drawn:

1) Based on the gap value analysis of the indicators of customer expectations or desires on the perception of the operational service quality of the Pulo Gebang Integrated bus terminal with the Service Quality method where the Pulo Gebang Integrated Bus Terminal has not been able to meet the expectations of service users in all service attributes, this is evidenced by all the value of the gap in all service attributes is negative (-). The attribute with question 15 (Security assurance and trust in service) has the highest gap value. The attribute with question no. 3 (Friendliness of officers in serving customers) has the lowest gap value.
2) Service attributes in quadrant one for program priority with the Importance Performance Analysis method, namely timeliness of departure and arrival (1), access to terminal locations (2), tranquility and comfort of terminals (6), knowledge and skills of terminal officers in dealing with passenger complaints (14), guarantee of security and trust in service (15), comfort of existing facilities in the terminal (16) as well as cleanliness and tidiness of buses and terminal officers (22). All attributes are in quadrant I where their handling needs to be prioritized because these attributes are considered very important by service users, but their performance is still not satisfactory and is included in the one-dimensional category, where for this need, customer satisfaction has a linear function with the performance of product attributes. High product attribute performance results in high customer satisfaction as well.

6.1 Research Limitations

This study has several limitations. First, the research is limited to the Pulo Gebang Integrated Bus Terminal, so the findings may not fully represent service conditions in other terminals with different operational characteristics. Second, the study relies on survey-based data and perceptions of users within a specific time period, which may not capture long-term trends or seasonal variations in service performance. Third, the analysis is primarily based on SERVQUAL, Importance Performance Analysis (IPA), and Quality Function Deployment (QFD) methods, without incorporating more advanced analytical or simulation approaches. Additionally, external factors such as policy changes, technological developments, and user behavior dynamics were not examined in depth.

6.2 Suggestions and Directions for Future Research

Based on the above conclusions, the authors provide the following suggestions:

1) To re-evaluate each service attribute, where customer expectations are still far from the performance or perception of services provided by the government. Whether it's conducting training for field employees who directly interact with customers, or by making improvements in the operation of the Pulo Gebang Integrated Bus Terminal so that it doesn't interfere with service.
2) Improvements that must be prioritized, namely the service attributes that are at the top priority, where it is the main interest for customers.
3) To improve service quality, researchers suggest service recommendations as follows:
   (a) Coordinate with related parties to increase the frequency of feeder trips to and from the terminal;
   (b) The need for additional security officers at the Pulo Gebang Integrated Bus Terminal;
   (c) Improve quality with training for Terminal officers to resolve passenger complaints in accordance with minimum service standards;
   (d) Coordinate with related parties by increasing the number of security officers;
   (e) The need for additional security officers and CCTV at every corner at the Pulo Gebang Integrated Bus Terminal;
   (f) Developing an application for purchasing bus travel tickets at the Pulo Gebang Integrated Bus

Terminal to determine the arrival and departure times of buses;

(g) Adding more personnel in the implementation of monitoring the cleaning and tidiness of buses in order to increase the comfort of service users.

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Author Contributions

Conceived and designed the study (A.A.); collected data (A.A.); performed analysis (A.A.); wrote the manuscript (A.A.); data collection and analysis (M.N.H.); provided critical revisions to the manuscript (M.N.H.); study design (S.); data collection and analysis (S.); and provided guidance on research methodology (S.); provided expert advice on data interpretation and the application of Quality Function Deployment (B.H.T.).

Conflicts of Interest

The authors declare that there are no conflicts of interest related to this study. The research was conducted independently, and the authors have no financial or personal relationships that could have influenced the research outcomes.

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