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The Role of Green Operational Practice and Electronic Customer Relationship Management in Improving Patient Satisfaction at Primary Health Care Facilities

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ABSTRACT

Purpose – This study examines the effect of Green Operational Practice (GOP) and Electronic Customer Relationship Management (E-CRM) on patient satisfaction at primary health care facilities, and the moderating role of Green Social Influence (GSI) and Operations Green Social Behaviour (OGSB).

Design/methodology/approach – This study used a quantitative explanatory design. Primary data were collected via a seven-point Likert questionnaire from 150 patients at a primary health care facility and analysed using variance-based structural equation modelling with SmartPLS 4 through a disjoint two-stage approach, because GOP was modelled as a reflective-reflective higher-order construct represented by green building, eco-design, green supply chain, and green innovation.

Findings – GOP and E-CRM both positively and significantly affect patient satisfaction. Together with the moderating variables and their interactions, they explain 63.3% of its variance ($R^2 = 0.633$). GSI does not moderate either relationship. OGSB does not moderate the GOP relationship but significantly strengthens the effect of E-CRM on patient satisfaction ($\beta = 0.240$; $p = 0.032$).

Research limitations/implications – This study is limited by its cross-sectional design and its scope, covering only one primary health care facility, so the results should be generalised with caution. Managers of primary health care facilities are advised to prioritise strengthening responsive digital services while maintaining environmentally friendly operational practices as a foundation of service quality.

Originality/value – This study extends prior research, which has largely focused on hospitals, by examining the combined role of GOP, E-CRM, GSI, and OGSB in the underexplored context of primary health care facilities, particularly in Indonesia.

INTRODUCTION

Patient satisfaction remains a persistent challenge at primary health care facilities in Indonesia, where high patient volumes, limited consultation time, and administrative bottlenecks continue to constrain the service experience despite ongoing efforts towards facility accreditation and service-quality governance (Arnindiah & Safriantini, 2019; Putri & Prianthara, 2026). Because primary health care facilities are typically patients' first and most

frequent point of contact with the health system, unresolved dissatisfaction at this level directly affects continuity of care and the broader performance of the National Health Insurance (*Jaminan Kesehatan Nasional*) scheme. This gap in patient satisfaction at the primary-care level is the core problem motivating the present study, which examines environmentally friendly operational practice and digital patient relationship management as two strategies available to primary health care facilities to address it.

Operational performance in health care facilities has largely focused on the efficiency of day-to-day service processes (Lee et al., 2023), while attention to patient satisfaction has lagged behind other service sectors. As the health care industry develops, health care facilities are now competing to improve patient satisfaction as part of their strategy (Mahrinasari et al., 2023).

One approach that has begun to be adopted is environmentally friendly operational practice, or Green Operational Practice (GOP). Conceptually, GOP covers planning, process design, supply chain management, and long-term-oriented innovation aimed at reducing environmental impact without neglecting socio-economic value (Nunes et al., 2016). In health care facilities, its implementation is reflected in environmentally conscious building management, design, supply chain, and innovation (Migdadi & Omari, 2019; Thomas et al., 2023). Across sectors, these practices have been shown to drive sustainable organisational performance (Mehta & Tariq, 2020; Wang & Yang, 2021). Awareness of environmentally friendly practices has also been found to influence consumer preferences for the products and services offered (Wiyadi, 2016). At the same time, digital transformation has given rise to Electronic Customer Relationship Management (E-CRM), an information-technology-based customer relationship management system that enables organisations to provide faster, more personal, and more responsive service (Liu et al., 2006; Lokesh & Vinayagam, 2023).

Implementing environmentally friendly practices also involves relevant social dynamics, namely Green Social Influence (GSI) and Operations Green Social Behaviour (OGSB). Both aspects reflect how social norms and the concrete actions of staff and patients can strengthen or weaken the effect of sustainability practices on patients' evaluations (Yao, 2024).

Previous studies have found that GOP and E-CRM jointly affect patient satisfaction in hospitals, both at the ASEAN level (Mahrinasari et al., 2024) and in Indonesian hospitals, with GSI moderating the relationship (Mahrinasari et al., 2023). Research in other service sectors provides further evidence that E-CRM contributes positively to customer experience and satisfaction (Al-Bashayreh et al., 2022; Lokesh & Vinayagam, 2023), while customer relationship management is associated with patient satisfaction and loyalty in hospitals (Abekah-Nkrumah et al., 2021). The quality of service received is also closely related to the level of satisfaction of inpatients enrolled in the National Health Insurance scheme (Arnindiah & Safriantini, 2019). Green supply chain practices and eco-design have also been reported to affect operational performance and patient experience positively (Albrakat et al., 2023; Rossi et al., 2024; Sadatsafavi et al., 2015).

Most of these studies have focused on advanced-level health care facilities, namely hospitals, while primary health care facilities have not been widely studied, particularly in Indonesia. In addition, researchers have rarely tested the moderating role of GSI and OGSB in the relationships between GOP and E-CRM and patient satisfaction simultaneously within a single model.

This study was designed to fill this gap by analysing the role of GOP and E-CRM in improving patient satisfaction at primary health care facilities, and by examining whether GSI and OGSB moderate these relationships. From a business perspective, patient satisfaction is not

merely a service-quality metric but a strategic determinant of patient loyalty, operational efficiency, and financial sustainability in primary health care facilities. Improving satisfaction through GOP and E-CRM may reduce service delivery costs, enhance resource utilisation, and strengthen the facility's competitive position in the health care market, giving the present study direct relevance to economics and business research on operational strategy and customer relationship management. Based on the above discussion, the research hypotheses are formulated as follows.

H1: Green Operational Practice positively affects patient satisfaction.

H2: Electronic Customer Relationship Management positively affects patient satisfaction.

H3: Green Social Influence moderates the relationship between Green Operational Practice and patient satisfaction.

H4: Green Social Influence moderates the relationship between Electronic Customer Relationship Management and patient satisfaction.

H5: Operations Green Social Behaviour moderates the relationship between Green Operational Practice and patient satisfaction.

H6: Operations Green Social Behaviour moderates the relationship between Electronic Customer Relationship Management and patient satisfaction.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Figure 1 presents the conceptual framework describing the relationships among these variables.

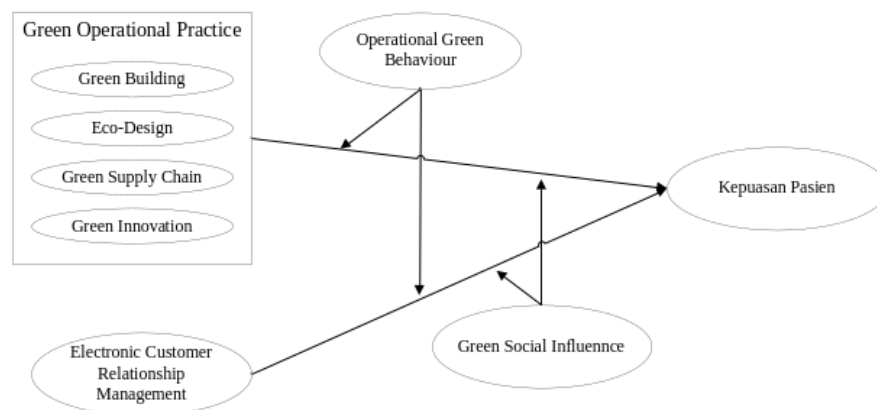


Figure 1. Conceptual Research Framework

This study's results are expected to contribute theoretically to hospital administration studies, particularly in the context of primary care services, and to contribute practically to managers of primary health care facilities by informing strategies to improve patient satisfaction that are efficient, digital, and environmentally friendly.

RESEARCH METHODOLOGY

This study employed a quantitative approach with an explanatory design to test the effects of GOP and E-CRM on patient satisfaction and to examine the moderating role of GSI and OGSB (Rapingah et al., 2022; Sardana et al., 2023). The research was conducted at a primary health care facility, with patients who had received services there as the subjects.

The study population consisted of patients using services at primary health care facilities. The research sample comprised 150 respondents obtained through a non-probability technique, with the criterion that respondents had received services at the research site. They were willing to complete the questionnaire in full (Slamet Riyanto & Winarti Setyorini, 2024). A sample of 150 respondents was considered adequate for variance-based structural equation modelling, which does not require the large samples typically needed for covariance-based structural equation modelling to produce stable parameter estimates. Applying the widely used 10-times rule to the largest number of structural paths pointing at a single construct in this model, together with power considerations for detecting medium effect sizes at the 5% significance level, indicates that the sample of 150 respondents exceeds the recommended minimum sample size for the structural model tested in this study (Hair et al., 2022).

The research variables consisted of independent variables (GOP and E-CRM), a dependent variable (patient satisfaction), and moderating variables (GSI and OGSB). GOP was positioned as a reflective-reflective higher-order construct represented by four dimensions, namely green building, eco-design, green supply chain, and green innovation (Migdadi & Omari, 2019). Table 1 presents the operational definitions of each variable.

Table 1. Operational Definitions of Variables

Variable	Operational Definition	Dimensions	Scale
GOP	Environmentally friendly operational practice at the health care facility	Green building, eco-design, green supply chain, green innovation	Likert 1–7
E-CRM	Information-technology-based management of patient relationships	Digital communication, service information, complaint response, electronic medical records	Likert 1–7
GSI	Social influence encouraging support for green practices	Social norms, social encouragement, social role modelling	Likert 1–7
OGSB	Green social behaviour in service operations	Resource conservation, green compliance, waste reduction	Likert 1–7
Patient Satisfaction	Patients' evaluation of the service experience received	Comfort, speed, clarity of information, service experience	Likert 1–7

Source: Adapted from the research instrument, 2026

The research instrument was a closed questionnaire using a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The questionnaire included respondents' general characteristics (age, level of education, visit frequency) and 70 statement items measuring all research constructs before indicator trimming.

Respondents' demographic characteristics (age, gender, level of education, and visit frequency) were collected as descriptive profiling variables but were not entered as control variables in the structural model. This choice follows the study's explanatory design, which tests the hypothesised relationships among GOP, E-CRM, GSI, OGSB, and patient satisfaction rather than isolating the net effect of demographic covariates. The sample was also drawn from a single primary health care facility with a relatively homogeneous service context, which limits the additional variance demographic controls could explain. Future research using a larger,

multi-site, and more heterogeneous sample is encouraged to test these characteristics as control variables.

This study collected primary data by distributing questionnaires to patients who met the criteria, preceded by an explanation of the research objectives, response confidentiality, and the voluntary nature of participation. The collected data were checked for completeness before being processed through descriptive analysis and structural model analysis (Hair et al., 2022).

Data analysis was conducted in two parts, namely descriptive analysis to describe respondent characteristics and response tendencies for each construct, and inferential analysis using variance-based structural equation modelling with SmartPLS 4. Because GOP is a higher-order construct, model testing used a disjoint two-stage approach that separates the evaluation of lower-order and higher-order constructs to improve estimation stability and model interpretability (Gio et al., 2024; Hair et al., 2022).

The first-stage measurement model evaluation assessed indicator validity and reliability using outer loadings, average variance extracted (AVE), Cronbach's alpha, composite reliability, and discriminant validity using the Fornell–Larcker criterion and the heterotrait–monotrait (HTMT) ratio. This study carefully evaluated indicators with low values and trimmed them only when removing an indicator improved the measurement model without disregarding its conceptual relevance.

The second-stage structural model evaluation assessed the R^2 value and the path coefficients among variables. Hypothesis testing used bootstrapping at the 95% confidence level, and a relationship was declared significant if the t -statistic exceeded 1.96 and the p -value was less than 0.05.

This study followed research ethics principles, including respondent confidentiality, voluntary participation, and the use of data solely for academic purposes.

RESULTS AND DISCUSSION

A. Respondent Characteristics

The researchers obtained data from 150 patient respondents at the primary health care facility. Table 2 presents respondent characteristics by age, education level, and visit frequency.

Table 2. Respondent Characteristics

Category	Group	Frequency	Percentage (%)
Age	Below 18 years	6	4.0
	18–25 years	36	24.0
	26–35 years	49	32.7
	36–45 years	32	21.3
	Above 45 years	27	18.0
Level of Education	Junior high school or below	17	11.3
	Senior high school/equivalent	71	47.3
	Diploma (D3)	20	13.3

Category	Group	Frequency	Percentage (%)
	Bachelor's degree (S1)/equivalent	38	25.3
	Master's degree (S2)	3	2.0
	Pharmacist	1	0.7
Visit Frequency	< 3 times in the last month	100	66.7
	> 3 times in the last month	50	33.3

Source: Authors' analysis of primary data, 2026. Percentages may not sum to 100 because of rounding.

The largest group of respondents was in the 26–35 age group (49 people; 32.7%), followed by the 18–25 age group (36 people; 24.0%), indicating a predominance of working-age patients who may be relatively familiar with digital services. By education level, the largest proportions of respondents had completed senior high school or its equivalent (71 people; 47.3%) and a bachelor's degree or its equivalent (38 people; 25.3%), reflecting the diverse educational backgrounds of service users. A total of 100 respondents (66.7%) visited fewer than three times in the last month. In comparison, 50 respondents (33.3%) visited more than three times, indicating that most respondents still had first-hand experience of the service despite relatively low visit frequency.

B. Descriptive Statistics of Research Variables

Table 3 presents the descriptive statistics of the research constructs.

Table 3. Descriptive Statistics of Research Constructs

Construct	Mean	Std. Deviation	Min	Max
Green Building	5.485	1.058	1.00	7.00
Eco-Design	5.845	0.894	1.00	7.00
Green Supply Chain	5.761	0.949	1.00	7.00
Green Innovation	5.737	0.869	1.00	7.00
Green Operational Practice	5.714	0.812	1.00	7.00
Electronic Customer Relationship Management	6.218	0.769	1.00	7.00
Operations Green Social Behaviour	5.645	1.059	1.00	7.00
Green Social Influence	5.735	1.015	1.00	7.00
Patient Satisfaction	6.068	0.769	1.00	7.00

Source: Authors' analysis of primary data, 2026

The mean values of all constructs are above the scale's midpoint (4.00), indicating a generally positive assessment by respondents across all research variables. E-CRM obtained the highest mean (6.218), followed by patient satisfaction (6.068), indicating that respondents

perceived electronic patient relationship management favourably and were generally satisfied with the service. The mean value of GOP (5.714) shows that respondents also rated environmentally friendly operational practices reasonably well. However, the green building dimension has a relatively lower mean than the other dimensions, leaving room for improvement.

C. Measurement Model Evaluation

The first-stage measurement model evaluation covered all manifest indicators. The trimming process removed indicators with low outer loadings or those that reduced the AVE, leaving valid indicators for each construct. Table 4 summarises the outer loading, reliability, and convergent validity results.

Table 4. Outer Loading, Reliability, and Convergent Validity Results After Trimming

Construct/Dimension	Outer Loading	Cronbach's Alpha	Composite Reliability	AVE
Green Building (4 indicators)	0.777–0.823	0.818	0.878	0.644
Eco-Design (4 indicators)	0.774–0.902	0.854	0.900	0.694
Green Supply Chain (5 indicators)	0.812–0.864	0.895	0.923	0.705
Green Innovation (7 indicators)	0.717–0.781	0.872	0.901	0.566
E-CRM (8 indicators)	0.712–0.846	0.914	0.930	0.625
OGSB (5 indicators)	0.763–0.877	0.875	0.909	0.668
GSI (4 indicators)	0.854–0.877	0.888	0.922	0.748
Patient Satisfaction (8 indicators)	0.719–0.891	0.932	0.945	0.682

Source: Authors' analysis of primary data using SmartPLS 4, 2026

All indicators have outer loadings above 0.70, and all constructs have Cronbach's alpha and composite reliability above 0.70 and AVE above 0.50, thereby satisfying the criteria for convergent validity and internal reliability (Hair et al., 2022).

Discriminant validity was tested through the Fornell–Larcker criterion and HTMT ratio. Table 5 presents the Fornell–Larcker criterion results.

Table 5. Fornell–Larcker Criterion Results

Construct	E-CRM	Eco-Design	GSI	Green Building	Green Innovation	Green Supply Chain	PS	OGSB
E-CRM	0.791							
Eco-Design	0.363	0.833						
GSI	0.224	0.285	0.865					
Green Building	0.281	0.527	0.251	0.802				
Green Innovation	0.395	0.434	0.611	0.282	0.752			
Green Supply Chain	0.349	0.752	0.384	0.538	0.650	0.840		
PS	0.578	0.380	0.592	0.316	0.580	0.477	0.826	
OGSB	0.229	0.273	0.745	0.297	0.635	0.435	0.541	0.817

Source: Authors' analysis of primary data using SmartPLS 4, 2026. Diagonal values represent the square roots of AVE. PS = patient satisfaction.

Table 5 shows that the square root of AVE on the diagonal for each construct is greater than its correlation with other constructs, so the Fornell–Larcker criterion is satisfied. Additional testing through the HTMT ratio also shows that all values are below the 0.90 threshold, with the highest values found in the relationship between Green Supply Chain and Eco-Design (0.852) and between OGSB and GSI (0.841). Thus, all constructs in the research model have good discriminant validity, so that the analysis can proceed to the structural model evaluation stage.

In the second stage, this study used the latent scores of the four constituent dimensions to form the GOP construct as a higher-order construct through the disjoint two-stage approach. Table 6 presents the evaluation results.

Table 6. Outer Loading and Reliability Results of the GOP Higher-Order Construct

Dimension	Outer Loading	Remarks
Green Building	0.658	Low, retained
Eco-Design	0.813	Valid
Green Supply Chain	0.921	Valid
Green Innovation	0.804	Valid

GOP (higher-order) construct reliability: Cronbach's alpha 0.819; composite reliability 0.879; AVE 0.674.

Source: Authors' analysis of primary data using SmartPLS 4, 2026

The Green Supply Chain dimension contributes most to GOP (0.921), followed by Eco-Design (0.813) and Green Innovation (0.804). The Green Building dimension has a relatively low outer loading value (0.658) but is retained because it is conceptually important in explaining physical comfort and the environmental quality of primary health care services (Allen et al., 2015; Sadatsafavi et al., 2015). The reliability values of the GOP construct show that this higher-order construct satisfies the criteria for reliability and convergent validity.

D. Structural Model Evaluation and Hypothesis Testing

Structural model evaluation assessed the ability of the independent variables, moderating variables, and moderating interactions to explain variance in patient satisfaction, as shown by the R^2 value in Table 7.

Table 7. R^2 Value

Variable	R^2	Adjusted R^2
Patient Satisfaction	0.633	0.612

Source: Authors' analysis of primary data using SmartPLS 4, 2026

The R^2 value of 0.633 shows that GOP, E-CRM, GSI, OGSB, and their moderating interactions can explain 63.3% of the variance in patient satisfaction. In contrast, the remaining 36.7% is attributable to other factors outside the model, such as clinical service quality, waiting time, cost perception, and patient trust.

Table 8 and Figure 2 present the hypothesis-testing results from the bootstrapping procedure.

Table 8. Hypothesis Testing Results

Hypothesis	Path	Path Coefficient (β)	t -statistic	p -value	Remarks
H1	GOP $\rightarrow$ PS	0.165	2.193	0.028	Supported
H2	E-CRM $\rightarrow$ PS	0.431	6.144	< 0.001	Supported
H3	GSI $\times$ GOP $\rightarrow$ PS	-0.130	1.274	0.203	Not supported
H4	GSI $\times$ E-CRM $\rightarrow$ PS	-0.034	0.255	0.798	Not supported
H5	OGSB $\times$ GOP $\rightarrow$ PS	0.076	0.878	0.380	Not supported
H6	OGSB $\times$ E-CRM $\rightarrow$ PS	0.240	2.144	0.032	Supported

Source: Authors' analysis of primary data using SmartPLS 4, 2026. PS = patient satisfaction.

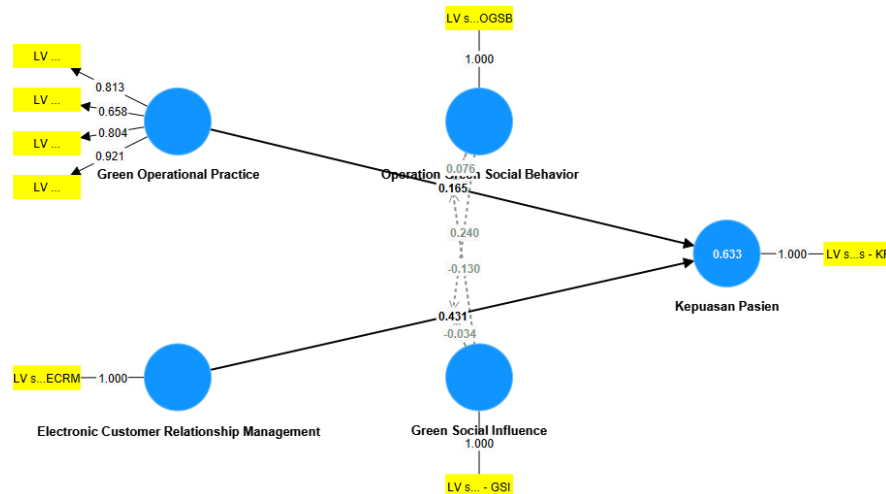


Figure 2. Structural Path Model (Stage II)

The results show two significant direct effects: GOP on patient satisfaction (H1 supported) and E-CRM on patient satisfaction (H2 supported), with E-CRM having a larger effect coefficient. Regarding the moderating effects, GSI does not moderate the relationship between either GOP or E-CRM and patient satisfaction (H3 and H4 not supported). OGSB also does not moderate the relationship between GOP and patient satisfaction (H5 not supported), but it significantly moderates the relationship between E-CRM and patient satisfaction (H6 supported).

E. Discussion

1. The Effect of Green Operational Practice on Patient Satisfaction

GOP has a positive and significant effect on patient satisfaction, with a path coefficient of 0.165 ($t = 2.193$; $p = 0.028$), so H1 is supported. This finding suggests that patients evaluate not only the medical treatment received but also the service environment, such as cleanliness, comfort, lighting, ventilation, and waste management. At primary health care facilities, the close interaction between patients and the physical environment may make these aspects more directly perceptible than at advanced-level services. This result reinforces previous findings that environmentally friendly operational practices contribute to the quality of the health care service experience (Sadatsafavi et al., 2015; Thomas et al., 2023), and is in line with evidence that the consistent implementation of green supply chain practices also improves an organisation's operational performance (Munawir et al., 2021). This pattern also aligns with the Stimulus–Organism–Response framework (Mehrabian & Russell, 1974), in which the physical service environment functions as an external stimulus that shapes patients' internal evaluative state and, in turn, their expressed satisfaction. The significant GOP effect suggests that this stimulus–organism–response mechanism operates even in primary care settings, where clinical outcomes, rather than environmental cues, might be assumed to dominate patients' judgments. Although significant, the GOP coefficient is smaller than that of E-CRM, suggesting that green practices serve more as a foundation for service quality. At the same time, patients tend to perceive the benefits of convenient, fast digital services more quickly.

2. The Effect of Electronic Customer Relationship Management on Patient Satisfaction

E-CRM has a positive and significant effect on patient satisfaction, with a path coefficient of 0.431 ($t = 6.144$; $p < 0.001$), making it the strongest predictor in this research model;

therefore, H2 is supported. Digital systems such as online registration, electronic medical records, service reminders, and complaint responses can reduce administrative barriers that often drive dissatisfaction in primary care, such as long queues and limited consultation time. Patients who receive clear information and fast responses through digital channels tend to evaluate the service more positively (Al-Bashayreh et al., 2022; Lokesh & Vinayagam, 2023). This finding suggests that E-CRM success depends not only on technology availability but also on health workers' and administrative staff's readiness to use it consistently and responsively.

3. The Moderating Role of Green Social Influence

The test results show that GSI does not moderate the relationship between GOP and patient satisfaction (coefficient -0.130 ; $p = 0.203$) or the relationship between E-CRM and patient satisfaction (coefficient -0.034 ; $p = 0.798$), so H3 and H4 are not supported. This finding differs from that of a hospital-based study, which found that GSI strengthened the relationship between green practices and patient satisfaction (Mahrinasari et al., 2023). Differences in service context may explain this result: patients at primary health care facilities generally seek fast, clear, and comfortable service, so satisfaction assessments are shaped more by direct service experience than by surrounding social norms. It is also possible that messages about green practices at the research site were not communicated consistently to patients, so green social norms were not strong enough to influence satisfaction assessments. Beyond inconsistent communication, this result may also reflect broader socialisation and cultural dynamics: GSI typically strengthens through repeated interpersonal reinforcement and role modelling within a community (Yao, 2024), a process that may not have time to unfold during a single, often brief visit to a primary health care facility. Statistical power may also play a part, because interaction effects are usually small and a sample of 150 respondents may have been too small to detect them. Future research combining survey data with qualitative approaches, such as patient interviews, could help clarify how communication, social reinforcement, and local cultural norms jointly shape GSI in primary care contexts.

4. The Moderating Role of Operations Green Social Behaviour

OGSB does not moderate the relationship between GOP and patient satisfaction (coefficient 0.076 ; $p = 0.380$), so H5 is not supported. However, OGSB significantly moderates the relationship between E-CRM and patient satisfaction (coefficient 0.240 ; $p = 0.032$), so H6 is supported. This finding suggests that green social behaviour in service operations may be more effective in strengthening the benefits of digital services than green practices that are physical or structural in nature. When staff behaviour that supports sustainability, such as consistent use of digital systems, paper reduction, and rapid response to patient requests, goes hand in hand with the implementation of E-CRM, patients tend to perceive the service as more modern, efficient, and oriented towards their needs. In contrast, in the GOP relationship, patients appear to assess building conditions, ventilation, or waste management merely as facility conditions, without directly associating them with the social behaviour of staff or other patients.

5. Managerial Implications and Research Limitations

An R^2 value of 0.633 indicates that the model comprising GOP, E-CRM, GSI, OGSB, and their moderating interactions has good explanatory power for patient satisfaction at primary health care facilities. The most urgent managerial priority is to strengthen E-CRM, given its dominant effect, while continuing to integrate it with efficient and environmentally friendly operational behaviour, such as reducing paper use and responding quickly to staff needs. At the

same time, GOP still needs to be developed as a foundation for environmental service quality through practical measures such as energy-use audits, waste sorting, using natural ventilation and lighting, and evaluating suppliers against environmental standards.

This study has several limitations that should be acknowledged when interpreting its findings. First, the cross-sectional design captures patient perceptions at a single point in time and therefore cannot establish causal relationships among GOP, E-CRM, GSI, OGSB, and patient satisfaction. Second, all constructs were measured through self-reported perceptual data collected with a single instrument, which is susceptible to respondent subjectivity and to common method bias. Third, the research scope was limited to a single primary health care facility using a non-probability sampling technique, and demographic characteristics were not entered as control variables, so caution is needed when generalising the findings to other primary health care facilities and patient populations. Fourth, GSI and OGSB were measured at a single point in time, which may not fully capture the cumulative, socially reinforced nature of GSI, which may take longer to develop and manifest as a moderating effect. Future research should employ a longitudinal or multi-wave design to strengthen causal inference, add other explanatory variables such as clinical service quality, patient trust, or cost perception, and expand the research scope to several primary health care facilities using probability sampling so the results are more representative and generalisable.

CONCLUSION

This study shows that both GOP and E-CRM significantly predict patient satisfaction in primary health care facilities, with E-CRM emerging as the strongest predictor. The research model, integrating both variables with the moderating variables, explains 63.3% of the variance in patient satisfaction, supporting the relevance of this approach to managing primary health care services.

GSI does not moderate the relationship between either GOP or E-CRM and patient satisfaction, suggesting that, in primary care services, social influence does not appear to be a dominant factor shaping patient satisfaction compared with direct service experience. In contrast, OGSB strengthens E-CRM's effect on patient satisfaction. However, it does not moderate the GOP relationship, suggesting that concrete green social behaviour in service operations is more relevant when linked to digital services than to physical green practices.

These findings imply that managers of primary health care facilities need to prioritise strengthening responsive digital services without neglecting environmentally friendly operational practices as a foundation for service quality, and encourage staff behaviour that consistently supports sustainability so patients can fully benefit from service digitalisation. These conclusions should be read in light of the study's limitations, which are set out above. Longitudinal, multi-site studies that add variables such as clinical service quality and patient trust would further clarify what drives patient satisfaction in primary health care.

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