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Patient Satisfaction and Associated Factors in a Tertiary Hospital in Ibadan, Nigeria

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Abstract

Background

Patient satisfaction is an important indicator of perceived healthcare quality and patient-centred care. However, evidence integrating interpersonal, technical, organisational and access-related dimensions of satisfaction in Nigerian tertiary hospitals remains limited. This study assessed factors associated with patient satisfaction across selected service domains in a tertiary hospital in Ibadan, Nigeria.

Methods

A hospital-based analytical cross-sectional study was conducted among 350 adult patients receiving care across seven departments. Patients were selected using systematic sampling, while 70 healthcare workers were purposively recruited for contextual assessment. Data were collected using a structured questionnaire. Overall satisfaction was classified as satisfied or dissatisfied, with neutral responses classified with dissatisfied responses. Associations were examined using chi-square tests and binary logistic regression. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were estimated from a comprehensive multivariable model.

Results

Among 350 patients, 267 (76.3%) were satisfied and 83 (23.7%) dissatisfied. Bivariate analyses demonstrated significant associations between satisfaction and multiple service-quality, infrastructure, staff-related, communication and financial-accessibility factors. In the final comprehensive model, satisfaction was independently associated with dignity and respect (AOR = 10.29, 95% CI: 4.32–24.50), access to medical specialists (AOR = 4.97, 95% CI: 2.26–10.96), and functional equipment (AOR = 4.09, 95% CI: 1.70–9.84). Patients aged 31–35 years had higher odds of satisfaction than those aged 18–24 years (AOR = 5.50, 95% CI: 1.35–22.34), while post-tertiary education was associated with lower odds (AOR = 0.12, 95% CI: 0.02–0.90). Gender, marital status and department were not independently associated with satisfaction. The final model was statistically significant (likelihood-ratio $\chi^2(18) = 151.10$, $p < 0.001$). Department and waiting time were significantly associated with satisfaction at bivariate level. Patients strongly endorsed transparent billing (97.4%), modern equipment (96.9%) and shorter waiting times (96.3%).

Conclusion

Patient satisfaction reflected multiple dimensions of tertiary healthcare delivery, with dignity and respect, specialist access and functional equipment emerging as independent correlates. Quality-improvement

efforts should prioritise respectful patient-centred care, functional resources and access to specialist services while addressing broader service, communication and financial-accessibility concerns. (Fig. 1)

INTRODUCTION

Patient satisfaction and patient experience are increasingly recognised as important dimensions of healthcare quality because they capture aspects of care that are not adequately reflected by conventional measures of clinical performance alone. Patient experience encompasses how individuals encounter healthcare services, including communication, interpersonal interactions, access, responsiveness, the care environment and administrative processes, whereas satisfaction reflects the extent to which the experienced care corresponds with patients' expectations and preferences (1, 2, 3). In low- and middle-income countries (LMICs), these dimensions are particularly important because constraints in workforce capacity, infrastructure, financing and service organisation can directly shape how patients experience healthcare. A recent scoping review of patient experience in LMICs identified four broad domains—compassionate care, healthcare providers, healthcare administration, and health policy and technology—with communication, interpersonal skills, hospital environment and processes, financial burden, patient rights and perceived quality of care emerging as recurrent themes (3). Thus, patient satisfaction represents not simply an attitudinal outcome but an important lens through which health-system responsiveness and quality can be assessed.

The determinants of satisfaction are inherently multidimensional. Systematic evidence indicates that patient satisfaction may reflect structural characteristics of healthcare facilities, technical quality of services, interpersonal relationships, communication, accessibility and the organisation of care (1, 4). Grönroos' service-quality model provides a useful framework for understanding this multidimensionality by distinguishing technical quality, referring to what patients receive from the service, from functional quality, referring to how the service is delivered (5). In healthcare, technical quality may include availability of competent personnel, diagnostic equipment, medicines and specialist services, whereas functional quality includes respect, communication, attention, confidentiality and timeliness. In this study, technical quality was operationalised primarily through patients’ assessments of specialist access, healthcare-worker adequacy, medication availability and functional equipment, while functional quality was reflected in dignity and respect, attention and care, communication, privacy, staff conduct and timeliness. Infrastructure and financial accessibility were treated as contextual dimensions that shape the delivery and experience of these service-quality components. These dimensions were examined in relation to the overall patient-satisfaction outcome. (Fig. 2).

Patient-centred-care evidence from sub-Saharan Africa similarly demonstrates that both relational and structural characteristics of care are important, with access to care, communication, respect, patient involvement and infrastructure forming interconnected dimensions of the patient experience (6). This suggests that dissatisfaction may arise even when clinical services are technically available if patients perceive care as inaccessible, disrespectful, poorly communicated or administratively difficult.

Evidence from Nigeria supports this multidimensional perspective but also demonstrates substantial contextual variation. A systematic review of Nigerian studies found considerable heterogeneity in reported patient satisfaction and identified provider attitudes, waiting times, pharmaceutical services, billing, laboratory services and other characteristics of care as relevant dimensions of patients' evaluations (7). Evidence from tertiary hospitals has similarly identified relationships with healthcare workers, communication, promptness of care and the physical environment as important components of satisfaction (8). More recent evidence from a federal tertiary hospital in Southwest Nigeria reported generally favourable satisfaction with quality of care but also demonstrated variation across service domains, reinforcing the importance of examining satisfaction beyond a single global measure (9). Studies from other Nigerian hospital settings have likewise identified provider-related characteristics, service accessibility and organisational factors among predictors of patient satisfaction (10, 11).

Timeliness represents one particularly important dimension of hospital experience. Waiting is not merely an inconvenience; it can reflect underlying problems in patient flow, staffing, appointment systems and service organisation. Evidence from Nigeria's health-insurance context has shown comparatively lower satisfaction with waiting times, pharmaceutical services, billing and referrals than with provider attitudes and the healthcare environment (12). Recent evidence from a Nigerian tertiary facility similarly identified prolonged waiting times among important patient concerns, alongside drug availability, administrative inefficiencies and provider–patient interactions (13). These findings are consistent with broader African evidence demonstrating that delays in healthcare delivery remain an important determinant of patients' evaluations of service quality (14). However, the extent to which waiting time independently predicts overall satisfaction may vary according to the service point, patient population and organisational context.

Interpersonal communication and financial accessibility represent two additional dimensions that warrant closer examination. Communication enables patients to understand diagnoses, treatment plans, risks and costs and to participate meaningfully in decisions about their care. Evidence from Ghana has linked communication competence and interpersonal relationships with patient satisfaction, while evidence synthesis from sub-Saharan African hospitals has identified communication, information sharing, respect and patient participation as central components of patient-centred care (6, 15). Financial accessibility is similarly relevant in Nigeria, where the costs and administrative processes associated with healthcare can influence perceptions of service quality. Evidence from the Nigerian National Health Insurance Scheme indicates that satisfaction varies across financial and service domains, including billing, pharmaceutical services, waiting time and referrals (12). A systematic review of health-insurance evidence from Nigeria and Ghana further identified affordability, service quality, communication and administrative processes as recurring influences on patient satisfaction (16).

Despite this growing evidence base, important gaps remain in understanding how multiple dimensions of patient experience operate together within Nigerian tertiary hospitals. Existing Nigerian studies have largely examined overall satisfaction within specific patient groups or service contexts, including health-insurance beneficiaries, or have focused on individual domains such as provider interactions, waiting

time, communication, billing or the physical environment (7–13). Consequently, less is known about the relative contribution of interpersonal, service-quality, infrastructural, organisational, communication and financial-accessibility factors when assessed within the same tertiary-care setting. Evidence is also limited on whether patient satisfaction varies across different hospital service points and on how patient assessments correspond with healthcare-worker perceptions of priority areas for improvement. The present study addresses these gaps by examining these dimensions concurrently across seven hospital departments and by incorporating healthcare-worker perspectives as contextual triangulation.

Against this background, this study examined patient satisfaction and its associated factors in a tertiary hospital in Ibadan, Nigeria. Specifically, it sought to (i) identify factors associated with overall patient satisfaction; (ii) assess the roles of healthcare service quality, infrastructure and staff behaviour in patient satisfaction; (iii) determine variation in satisfaction according to hospital department and service exposure; (iv) examine the associations of communication and financial accessibility with patient satisfaction; and (v) identify patient- and healthcare-worker-supported strategies for improving satisfaction. By assessing these interrelated dimensions concurrently across seven hospital service points and incorporating healthcare-worker perspectives, the study provides institution-level evidence on the factors associated with patient satisfaction and priorities for patient-centred quality improvement in a Nigerian tertiary-care setting.

METHODS

3.1 Study design and setting

A hospital-based analytical cross-sectional study was conducted among adult patients and healthcare workers at the University College Hospital (UCH), Ibadan, Oyo State, Nigeria.

UCH is a tertiary referral hospital providing a broad range of clinical, diagnostic and specialist services. Seven departments/service areas were included: Accident and Emergency, Dentistry, Gynaecology, Laboratory, Ophthalmology, Pharmacy and Physiotherapy. The departments were purposively selected to capture different types of patient-service encounters, including emergency care, clinical consultations, diagnostic services, pharmaceutical services and rehabilitative care. The selected service areas comprised both outpatient and service-based encounters; Accident and Emergency also provided emergency care. Data were collected over ten weeks between November 2025 and March 2026. During the study period, the selected service areas recorded approximately fifteen eligible patient encounters per day, based on departmental service registers.

3.2 Study population, sampling and sample size

Eligible patients were adults aged ≥ 18 years receiving inpatient or outpatient services in the selected departments. Healthcare workers included doctors, nurses, pharmacists, laboratory scientists and other clinical personnel who had worked in the selected departments for at least two years. Patients who were

critically ill, unable to provide informed consent, or declined participation were excluded; healthcare workers who were unavailable or on leave were also excluded.

The minimum sample size was determined using Cochran's formula for estimating a single population proportion:

$$[n_o = Z^2p(1 - p)/d^2]$$

where n_o is the initial sample size, Z = 1.96 for a 95% confidence level, p = 0.408 (40.8% expected satisfaction), and d = 0.05 (5% precision).

$n_o = (1.96^2 \times 0.408 \times 0.592)/0.05^2 = 371.2$, which was rounded to 371. Allowing 10% for non-response using the non-response inflation formula, $n = n_o/(1 - 0.10)$, gives 371/0.90 = 412.2; therefore, a minimum target of 412 participants was set. A total of 412 eligible patients were approached. Of these, 350 provided complete questionnaires and were included in the final analysis, corresponding to a response rate of 84.9%. Although the final analytical sample was smaller than the initially targeted sample because of non-response and incomplete questionnaires, all 350 complete observations were retained for the planned analyses. The binary outcome comprised 267 satisfied and 83 dissatisfied respondents. The multivariable analyses were conducted as domain-specific logistic regression models, thereby limiting the number of estimated parameters within each model. The final sample provided sufficient outcome observations for the fitted models and the precision of model estimates was assessed using 95% confidence intervals."

A multistage, non-probability/probability hybrid sampling approach was used. First, seven hospital service areas were purposively selected based on their relevance to different types of patient-service encounters and the feasibility of data collection during the study period. Second, within each selected service area, eligible patients were identified from the daily patient attendance/register lists. A systematic selection procedure was then used to approach eligible patients at approximately every third entry on the daily register until the departmental target was achieved. On each sampling day, the first eligible participant was selected using a random starting position among the first three eligible entries, after which every third eligible patient was approached. A total of 350 complete patient questionnaires were obtained. Healthcare workers were purposively selected from doctors, nurses, pharmacists, laboratory scientists and other clinical personnel who had worked in the selected service areas for at least two years. Ten eligible healthcare workers were recruited from each selected service area for complementary assessment of service-delivery perceptions, giving a total of 70 participants. The healthcare-worker component was descriptive and complementary rather than inferential and was used to provide contextual triangulation of patient-reported findings; it was not designed or powered to generate population-level estimates or to test associations.

3.3 Data collection instrument and procedures

Data were collected using a structured questionnaire adapted from the World Health Organization USAID / United States Agency for International Development (WHO/USAID) health-facility service-quality

assessment tool, the Patient Satisfaction Questionnaire, and a comparable Ugandan patient-satisfaction instrument. The questionnaire was adapted to the local context and comprised sections addressing sociodemographic characteristics, service-related factors, patient satisfaction, communication and financial accessibility, and recommended improvement strategies. The instrument was translated into Yoruba and back-translated into English to assess conceptual equivalence.

Five trained research assistants administered the questionnaire through self-completion for literate participants and interviewer administration, with Yoruba interpretation where required. The principal investigator conducted daily quality checks, including spot-checking 10% of completed questionnaires.

Content and face validity were assessed through expert review. Because the questionnaire items represented distinct service attributes and were analysed individually rather than combined into composite multi-item scales, internal-consistency reliability statistics such as Cronbach's alpha were not considered applicable to the primary analytical variables. Reliability assessment was therefore not used to justify aggregation of the individual items into domain scores.

A pilot test involving 42 participants was conducted in the UCH Dietetics Department to assess clarity, sequence and administration procedures, following which minor wording modifications were made.

3.4 Measurement of variables

The primary outcome was overall patient satisfaction, measured using the item, 'Overall, I am satisfied with my experience in this facility. A single global satisfaction item was used as the primary outcome because the study sought to capture patients' overall evaluative judgement of their experience in the facility rather than construct a composite satisfaction score. The individual service-quality, infrastructure, staff-behaviour, communication and financial-accessibility items were treated as distinct explanatory measures and were not combined into a composite scale.

Responses were recorded on a five-point scale ranging from very dissatisfied to very satisfied. For the inferential analysis, the response categories were intentionally dichotomised to distinguish respondents expressing an overall favourable assessment ('satisfied' or 'very satisfied') from those not expressing a favourable assessment ('neutral', 'dissatisfied' or 'very dissatisfied'). This classification was applied consistently across all regression analyses. Thus, all 350 eligible patient respondents were retained in the analysis, comprising 267 (76.3%) classified as satisfied and 83 (23.7%) classified as dissatisfied. For the regression analysis, the recoded outcome was coded as 1 = dissatisfied and 2 = satisfied.

Predictor variables included sociodemographic characteristics (age, sex, marital status and education), healthcare utilization and service exposure (department, frequency of hospital visits, waiting time and difficulty obtaining appointments), service-quality factors (attention and care, medication availability, specialist access and staffing adequacy), infrastructure (cleanliness, equipment functionality, facility maintenance and sitting areas), staff behaviour (dignity and respect, professional conduct and confidence in healthcare workers), communication, and financial accessibility.

Communication variables included explanation of diagnoses/procedures, communication regarding health conditions and treatment, opportunity to ask questions, and communication of treatment costs. Financial-accessibility variables included affordability, financial assistance, awareness of charges, billing systems, insurance/payment information and confidence in accessing needed care. Patient-recommended improvement strategies and healthcare-worker perceptions were analysed descriptively. Healthcare-worker responses were used solely as complementary contextual evidence to triangulate patient findings and were not subjected to inferential modelling or interpreted as population-level estimates.

For the communication and financial-accessibility items, the original five-point response categories were collapsed into three categories for analysis: ‘strongly agree’ and ‘agree’ were combined as ‘agree’; ‘indifferent’ was retained as a separate category; and ‘disagree’ and ‘strongly disagree’ were combined as ‘disagree’. In the corresponding regression models, ‘agree’ was specified as the reference category.

3.5 Statistical analysis

Data were analysed using EPInfo 7 and IBM SPSS Statistics version 27. Descriptive statistics were presented as frequencies and percentages. Associations between categorical predictors and overall satisfaction were assessed using Pearson's chi-square test, with exact testing considered where cell frequencies were inadequate. Crude odds ratios (ORs) and 95% confidence intervals (CIs) were reported for appropriate binary comparisons.

Variables demonstrating bivariate associations at $p < 0.20$ were considered for multivariable analysis, together with prespecified demographic and service-context variables considered potentially important confounders. Based on the conceptual framework, age, sex, marital status, educational level and department/service area were retained as adjustment variables. A single parsimonious multivariable binary logistic regression model was then fitted to estimate the independent associations of selected substantive service-quality indicators with overall patient satisfaction. The final model included dignity and respect, access to medical specialists, and functional equipment, together with the prespecified demographic and service-context covariates. These substantive variables were selected to represent distinct interpersonal, technical-access and infrastructural dimensions of the conceptual framework while limiting the number of estimated parameters relative to the available outcome events. The outcome was coded as 1 = dissatisfied and 2 = satisfied. Adjusted odds ratios (AORs) and 95% confidence intervals (CIs) were reported. Model likelihood-ratio tests were used to assess overall model significance, convergence was examined, and estimates with evidence of sparse-data instability were not interpreted substantively. Statistical significance was set at $p < 0.05$.

Regression coefficients, standard errors and test statistics were retained in the supplementary statistical output. Model likelihood-ratio tests were used to assess overall model significance, and estimates affected by sparse data were identified and treated as unstable. For multivariable logistic regression, categorical predictors were represented by their corresponding indicator parameters. Model estimates

were reported as adjusted odds ratios with 95% confidence intervals, with attention to the precision of estimates and sparse-category instability.

3.6 Ethical considerations

Ethical approval

was obtained from the relevant institutional ethics committee before commencement of the study -UI /EC/25/0517. Written informed consent was obtained from participants before questionnaire administration. Participation was voluntary, and completed questionnaires were handled confidentially and analysed without personally identifying information.

RESULTS

Of the 350 patients included in the analysis, 267 (76.3%) were classified as satisfied and 83 (23.7%) as dissatisfied with their overall experience, where for the analytical outcome, "satisfied" included respondents who selected "satisfied" or "very satisfied" and "dissatisfied" included respondents who selected "neutral", "dissatisfied" or "very dissatisfied", thus, all 350 complete observations were retained in the analysis.

Bivariate associations with overall patient satisfaction

Bivariate analysis demonstrated statistically significant associations between overall patient satisfaction and all assessed service-quality, infrastructure, staff-behaviour, communication and financial-accessibility measures (Table 1).

Dignity and respect, adequate attention and care, availability of medication, and adequate numbers of healthcare workers were significant service-quality factors associated with overall satisfaction (all $p < 0.001$). Infrastructure-related factors, such as cleanliness and hygiene, functional medical equipment, facility maintenance and adequate sitting areas, were also significant factors (all $p < 0.001$). Privacy, doctors' professional conduct, and confidence in healthcare-worker ability were also significant associations (all $p < 0.001$).

Overall satisfaction was significantly associated with communication measures ($\chi^2 = 21.57$, $df = 2$, $p < 0.001$), including the clear explanation of diagnoses and procedures ($\chi^2 = 21.57$, $df = 2$, $p < 0.001$), communication about health conditions and treatment ($\chi^2 = 12.87$, $df = 2$, $p = 0.002$), opportunity to ask questions ($\chi^2 = 10.61$, $df = 2$, $p = 0.005$), and communication of treatment costs ($\chi^2 = 28.57$, $df = 2$, $p < 0.001$), and with financial-accessibility measures ($\chi^2 = 26.60$, $df = 2$, $p < 0.001$), including affordability of services ($\chi^2 = 26.60$, $df = 2$, $p < 0.001$), availability of financial assistance ($\chi^2 = 18.57$, $df = 2$, $p < 0.001$), awareness of hospital charges and billing ($\chi^2 = 24.50$, $df = 2$, $p < 0.001$), user-friendliness of the billing system ($\chi^2 = 53.25$, $df = 2$, $p < 0.001$). accessible insurance/payment information ($\chi^2 = 74.10$, $df = 2$, $p < 0.001$), and confidence in accessing needed care ($\chi^2 = 56.91$, $df = 2$, $p < 0.001$) (Table 1).

Table 1

Bivariate associations between service-related, infrastructure, staff-behaviour, communication and financial-accessibility factors and overall patient satisfaction (n = 350)

Domain	Factor	Crude OR (95% CI)	χ^2	df	p-value
Service quality	Dignity and respect	0.06 (0.03–0.11)	93.98	1	< 0.001
	Adequate attention and care	0.06 (0.03–0.12)	88.80	1	< 0.001
	Medication availability	0.14 (0.08–0.24)	57.46	1	< 0.001
	Adequate HCW numbers	0.11 (0.06–0.19)	71.05	1	< 0.001
Infrastructure	Cleanliness/hygiene	0.22 (0.12–0.40)	27.77	1	< 0.001
	Functional medical equipment	0.08 (0.04–0.14)	87.84	1	< 0.001
	Facility maintenance	0.12 (0.07–0.21)	66.30	1	< 0.001
	Adequate sitting area	0.08 (0.05–0.15)	80.63	1	< 0.001
Staff behaviour	Privacy	0.12 (0.07–0.22)	59.32	1	< 0.001
	Doctors' professional conduct	0.16 (0.09–0.28)	46.47	1	< 0.001
	Confidence in HCW ability	0.38 (0.23–0.64)	14.01	1	< 0.001

Note: *OR = odds ratio; CI = confidence interval; HCW = healthcare worker; df = degrees of freedom. Crude ORs are presented for binary comparisons; the multi-category communication and financial-accessibility variables were assessed using Pearson's χ^2 test and therefore do not have a single crude OR in this table. For the binary variables, the OR corresponds to the comparison of the response category coded 2 ("satisfied") with the category coded 1 ("dissatisfied"). Percentages and classifications of the outcome were based on the prespecified dichotomisation described in the Methods.*

Domain	Factor	Crude OR (95% CI)	χ^2	df	p-value
Communication	Diagnoses/procedures clearly explained	—	21.57	2	< 0.001
	Clear communication about health condition/treatment	—	12.87	2	0.002
	Opportunity to ask questions	—	10.61	2	0.005
	Treatment costs clearly communicated	—	28.57	2	< 0.001
Financial accessibility	Services affordable	—	26.60	2	< 0.001
	Financial assistance available	—	18.57	2	< 0.001
	Awareness of hospital charges/billing	—	24.50	2	< 0.001
	User-friendly billing system	—	53.25	2	< 0.001
	Accessible insurance/payment information	—	74.10	2	< 0.001
	Confidence in accessing needed care	—	56.91	2	< 0.001

Note: *OR = odds ratio; CI = confidence interval; HCW = healthcare worker; df = degrees of freedom. Crude ORs are presented for binary comparisons; the multi-category communication and financial-accessibility variables were assessed using Pearson's χ^2 test and therefore do not have a single crude OR in this table. For the binary variables, the OR corresponds to the comparison of the response category coded 2 ("satisfied") with the category coded 1 ("dissatisfied"). Percentages and classifications of the outcome were based on the prespecified dichotomisation described in the Methods.*

Comprehensive multivariable analysis of factors associated with overall patient satisfaction

A single comprehensive binary logistic regression model was fitted to estimate the independent associations of selected substantive service-quality indicators with overall patient satisfaction while adjusting for prespecified demographic and service-context variables. The model included age, gender, marital status, educational level, department/service area, dignity and respect, access to medical specialists, and functional equipment.

Among the 350 patients analysed, the model included 83 patients classified as dissatisfied and specified 18 predictor degrees of freedom, corresponding to approximately 4.6 outcome events per predictor parameter. The model converged after five iterations and was statistically significant overall (likelihood-ratio $\chi^2(18) = 151.10$, $p < 0.001$; −2 log likelihood = 232.33).

After adjusting for the other covariates, patients who stated that they were treated with dignity and respect had significantly greater odds of overall satisfaction compared to those who were not (AOR = 10.29, 95% CI: 4.32–24.50; $p < 0.001$), patients who stated that they had easy access to the medical specialist they needed had greater odds of satisfaction (AOR = 4.97, 95% CI: 2.26–10.96; $p < 0.001$), and patients who felt that the equipment was up to date and functional had greater odds of satisfaction (AOR = 4.09, 95% CI: 1.70–9.84; $p = 0.002$).

Age was also associated with satisfaction. The odds ratio for age 31–35 years was 5.50 (95% CI: 1.35–22.34; $p = 0.017$) compared with 18–24 years, and the association for age 36 years and above was not statistically significant at the 5% level (AOR = 3.63, 95% CI: 0.96–13.70; $p = 0.057$). Patients with post-tertiary education were less likely to be satisfied (AOR = 0.12, 95% CI: 0.02–0.90; $p = 0.040$) than those with no formal education. After adjustment, the associations for gender, marital status, the other educational categories, age 25–30 years, and all department/service-area comparisons were not statistically significant (Table 2).

Table 2
Comprehensive multivariable logistic regression of factors associated with overall patient satisfaction (n = 350)

Predictor	Category/comparison	AOR	95% CI	p-value
Gender	Male vs Female	1.185	0.544–2.582	0.670
Marital status	Yes vs No	1.392	0.629–3.081	0.415
Educational level	Post-tertiary vs No formal education	0.117	0.015–0.902	0.040
	Primary vs No formal education	0.114	0.012–1.085	0.059
	Secondary vs No formal education	0.114	0.012–1.052	0.055
	Tertiary vs No formal education	0.150	0.020–1.118	0.064
Age	25–30 vs 18–24 years	1.890	0.525–6.808	0.330
	31–35 vs 18–24 years	5.498	1.353–22.340	0.017
	≥ 36 vs 18–24 years	3.635	0.964–13.701	0.057
Department/Ward	Dentistry vs Accident & Emergency	0.458	0.142–1.482	0.193
	Gynaecology vs Accident & Emergency	0.787	0.198–3.136	0.734
	Laboratory vs Accident & Emergency	1.978	0.442–8.858	0.373
	Ophthalmology vs Accident & Emergency	0.716	0.186–2.750	0.626
	Pharmacy vs Accident & Emergency	1.338	0.365–4.910	0.661
	Physiotherapy vs Accident & Emergency	0.823	0.220–3.077	0.772
Dignity and respect	Satisfied vs Dissatisfied	10.289	4.321–24.498	< 0.001
Access to medical specialist	Satisfied vs Dissatisfied	4.974	2.257–10.961	< 0.001

Predictor	Category/comparison	AOR	95% CI	p-value
Functional equipment	Satisfied vs Dissatisfied	4.094	1.703–9.843	0.002

Model statistics: Likelihood-ratio $\chi^2(18) = 151.10$, $p < 0.001$; Score $\chi^2(18) = 150.35$, $p < 0.001$; −2 log likelihood = 232.33; n = 350; model converged after five iterations.

Note

AOR = adjusted odds ratio; CI = confidence interval. The outcome was overall patient satisfaction, coded as 1 = dissatisfied and 2 = satisfied. The reference categories were female, unmarried/not married, no formal education, age 18–24 years, and Accident & Emergency, respectively. The multivariable model included 18 predictor degrees of freedom (slope parameters), plus the intercept. With 83 patients classified as dissatisfied, this corresponds to approximately 4.6 outcome events per predictor parameter. AORs are mutually adjusted for all variables shown in the table.

Variation in overall patient satisfaction by department and healthcare-service exposure

There was a significant variation in overall patient satisfaction across departments/wards ($\chi^2 = 15.13$, df = 6, p = 0.019), and according to waiting time before receiving care ($\chi^2 = 15.47$, df = 3, p = 0.0015) (Table 3). The percentage who were classified as satisfied varied from 64.0% in Accident & Emergency to 92.0% in the Laboratory. The percentage who were satisfied was 83.9% for those who waited more than 30 minutes and 68.5% for those who waited more than one hour. Overall satisfaction was not significantly related to frequency of hospital visits ($\chi^2 = 2.82$, df = 3, p = 0.420). As service-exposure findings, waiting-time and departmental differences were not interpreted as independent adjusted effects in the final comprehensive model and were not included in the final model due to unstable logistic regression estimate in the earlier service-exposure model as a result of sparse observations in the less-than-15-minute category (Table 3).

Table 3
Variation in overall patient satisfaction by department and healthcare-service exposure (n = 350)

Variable	Category	Dissatisfied, n (%)	Satisfied, n (%)	χ^2	df	p-value
Department/Ward	Accident & Emergency	18 (36.0)	32 (64.0)	15.13	6	0.019
	Dentistry	16 (32.0)	34 (68.0)			
	Gynaecology	11 (22.0)	39 (78.0)			
	Laboratory	4 (8.0)	46 (92.0)			
	Ophthalmology	8 (16.0)	42 (84.0)			
	Pharmacy	12 (24.0)	38 (76.0)			
	Physiotherapy	14 (28.0)	36 (72.0)			
Waiting time before care	< 15 minutes	0 (0.0)	15 (100.0)	15.47	3	0.0015
	15–30 minutes	2 (25.0)	6 (75.0)			
	> 30 minutes	23 (16.1)	120 (83.9)			
	> 1 hour	58 (31.5)	126 (68.5)			
Frequency of hospital visits	Frequently	26 (22.0)	92 (78.0)	2.82	3	0.420
	Occasionally	22 (20.0)	88 (80.0)			
	Rarely	26 (29.5)	62 (70.5)			
	Very often	9 (26.5)	25 (73.5)			

Note: Percentages were calculated within categories. χ^2 = Pearson chi-square statistic; df = degrees of freedom. "Satisfied" includes satisfied and very satisfied responses; "dissatisfied" includes neutral, dissatisfied and very dissatisfied responses. Department and waiting-time associations are presented as bivariate service-exposure findings.

Communication and financial accessibility

At the bivariate level, all assessed communication measures were significantly associated with overall patient satisfaction (Table 1). These included explanation of diagnoses and procedures, communication about health conditions and treatment, opportunity to ask questions, and communication of treatment costs.

Financial-accessibility measures were also significantly associated with overall satisfaction at the bivariate level. These included affordability of services, availability of financial assistance, awareness of

hospital charges and billing, user-friendliness of the billing system, accessible insurance/payment information, and confidence in accessing needed care (Table 1).

Communication and financial-accessibility variables were not included in the final parsimonious comprehensive logistic regression model. Therefore, their findings are reported here as bivariate associations and are not presented as independently adjusted associations.

Recommended strategies for improving patient satisfaction

Patients reported high levels of agreement with all proposed strategies for improving patient satisfaction (Table 4). Agreement ranged from 94.0% for increasing the number of healthcare workers to 97.4% for more transparent billing systems. Other highly endorsed strategies included investment in modern medical equipment (96.9%), government support for hospital services (96.6%), shorter waiting times (96.3%), better training in handling patient complaints (96.3%), ensuring privacy during consultation and treatment (96.3%), and prompt responses to complaints and grievances (96.0%).

Among healthcare workers, 98.6% supported better training on handling patient complaints and prompt responses to complaints, while 97.1% supported shorter waiting times. Increasing the number of healthcare workers and regular patient-feedback surveys were each supported by 94.3% of healthcare workers. Other healthcare-worker responses showed that 28.6% agreed that the facility had sufficient staff for the patient load, 64.3% reported easy access to specialists, and 74.3% reported timely communication regarding test results and follow-up (Table 4).

All proposed strategies for improving patient satisfaction had high levels of agreement by patients (Table 4), ranging from 94.0% for increasing the number of healthcare workers to 97.4% for more transparent billing systems. Highly endorsed strategies included investment in modern medical equipment (96.9%), government support for hospital services (96.6%), shorter waiting times (96.3%), better training in handling patient complaints (96.3%), ensuring privacy during consultation and treatment (96.3%), and prompt responses to complaints and grievances (96.0%). Ninety-eight percent of healthcare workers supported better training on handling patient complaints and prompt responses to complaints, 97.1% supported shorter waiting times, and 94.3% supported increasing the number of healthcare workers. Other healthcare-worker responses revealed that 28.6% agreed that the facility had sufficient staff for the patient load, 64.3% reported easy access to specialists, and 74.3% reported timely communication regarding test results and follow-up (Table 4).

Table 4
Patient and healthcare-worker recommendations for improving patient satisfaction

Improvement strategy/indicator	Patients: Agree, n (%)	HCWs: Agree, n (%)
Increasing the number of HCWs	329 (94.0)	66 (94.3)
Improving cleanliness and facility maintenance	332 (94.9)	44 (62.9)
Better training on handling patient complaints	337 (96.3)	69 (98.6)
Shorter waiting times	337 (96.3)	68 (97.1)
Regular patient-centred-care training	336 (96.0)	—
Prompt response to complaints and grievances	336 (96.0)	69 (98.6)
Government support for hospital services	338 (96.6)	—
Investment in modern medical equipment	339 (96.9)	—
More transparent billing systems	341 (97.4)	—
Ensuring privacy during consultation/treatment	337 (96.3)	—
Clear and consistent treatment updates	335 (95.7)	—
Regular patient feedback surveys	333 (95.1)	66 (94.3)
Hospital provided a supportive work environment	—	39 (55.7)
Facility had enough staff for patient load	—	20 (28.6)
Patients had easy access to specialists	—	45 (64.3)
Patients received timely and respectful care	—	46 (65.7)
Good relationship between staff and patients	—	57 (81.4)
Timely communication about test results/follow-up	—	52 (74.3)
User-friendly billing/payment systems	—	36 (51.4)
Diagnoses/procedures clearly explained	—	64 (91.4)
Patients properly informed about service costs	—	64 (91.4)
Accessible insurance/payment information	—	38 (54.3)

Note: Patient sample n = 350; healthcare-worker sample n = 70. HCWs = healthcare workers. "Agree" represents agreement with the stated improvement strategy or indicator as applicable to the respondent group. "—" indicates that the corresponding item was not assessed in that respondent group.

DISCUSSION

Principal findings

This study found that 76.3% of patients were satisfied and 23.7% dissatisfied. At bivariate level, satisfaction was significantly associated with service-quality, infrastructure, interpersonal, communication and financial-accessibility factors. In the final comprehensive model, dignity and respect, access to medical specialists and functional equipment remained independently associated with satisfaction. Patients aged 31–35 years had higher adjusted odds of satisfaction than those aged 18–24 years, whereas post-tertiary education was associated with lower adjusted odds. Gender, marital status, the other age groups and department were not independently associated.

Dignity and respect showed the strongest adjusted association (AOR 10.289, 95% CI 4.321–24.498; $p < 0.001$), underscoring the importance of interpersonal care. This agrees with evidence identifying dignity, respect, communication, privacy and responsiveness as core patient-centred-care dimensions in sub-Saharan Africa (6), and with LMIC evidence emphasizing interpersonal relationships and respect for patients' rights (3). Nigerian studies reported the importance of interpersonal manner and communication in tertiary hospitals (8, 9), while other Nigerian evidence identified service-delivery factors associated with satisfaction (10, 11, 17). Adequate attention and care, staffing adequacy, professional conduct, privacy and confidence in healthcare-worker ability were significant bivariate correlates, but did not remain independently significant after adjustment. This distinction is consistent with evidence that patient satisfaction reflects overlapping structural, process and interpersonal dimensions (1, 2).

Functional equipment remained independently associated with satisfaction (AOR 4.094, 95% CI 1.703–9.843; $p = 0.002$). This supports evidence that physical and technical dimensions contribute to perceived service quality (2), while Low Middle Income Countries-(LMIC) evidence identifies infrastructure and service availability as important components of patient experience (3). Nigerian evidence similarly links service availability and quality with satisfaction (7, 9). Facility maintenance, sitting areas, cleanliness and medication availability were significant bivariate correlates but were not independently significant in the final model.

Access to medical specialists was also independently associated with satisfaction (AOR 4.974, 95% CI 2.257–10.961; $p < 0.001$). It complements the equipment finding by indicating that perceived technical capacity involves both specialist personnel and functional resources (7, 9).

Satisfaction varied significantly by department and waiting time at bivariate level, but department was not independently significant after adjustment. Waiting time was also not retained in the final model because sparse categories produced unstable estimates; therefore, no adjusted waiting-time effect should be inferred. Nevertheless, the bivariate finding is consistent with evidence on waiting and service-delivery concerns in Nigerian tertiary facilities (12, 13) and African primary-care settings (14), as well as evidence linking promptness with satisfaction (8).

Communication and financial-accessibility measures were significantly associated with satisfaction at bivariate level. Clear explanations, opportunities to ask questions, cost communication, affordability, billing and insurance/payment information were important patient-experience domains. These findings align with evidence on communication competence and interpersonal relationships in Ghana (15), patient-centred communication in sub-Saharan Africa (6), Nigerian evidence on communication (8, 9, 16), and evidence concerning financial accessibility and insurance-related satisfaction (7, 12, 16). However, these variables were not retained in the final model and should therefore not be described as independent predictors.

The age and education findings require caution. The higher adjusted satisfaction among patients aged 31–35 years (AOR 5.498, 95% CI 1.353–22.340; p = 0.017) and lower adjusted satisfaction among post-tertiary respondents (AOR 0.117, 95% CI 0.015–0.902; p = 0.040) may reflect differences in expectations or healthcare experiences, but these mechanisms were not measured. Patient and healthcare-worker recommendations converged around shorter waiting times, increased staffing, modern equipment, complaint management and transparent billing, supporting the broader patient-centred-care perspective (6, 18).

Overall, the findings support a multidimensional understanding of satisfaction and indicate that respectful care, specialist access and functional equipment are particularly important quality-improvement targets. Because the study was cross-sectional, these associations should not be interpreted causally.

4.8 Theoretical and Policy Implications

The findings support Grönroos' service-quality model, which distinguishes technical quality—what patients receive—from functional quality—how care is delivered (5). Dignity and respect represent functional quality, while specialist access and functional equipment reflect technical and organisational capacity. The broader bivariate findings involving communication, timeliness, staffing, infrastructure and financial accessibility reinforce the multidimensional nature of patient experience. Quality improvement should therefore combine respectful patient-centred care with functional resources, specialist access, efficient service processes and transparent financial arrangements, consistent with evidence linking patient experience with health-system responsiveness and quality (3, 19–24). This interpretation is also consistent with conceptualisation of healthcare service quality and satisfaction (4, 19–20).

4.9 Strengths and Limitations

Strengths included assessment across seven service areas, broad measurement of service-quality and patient-experience domains, healthcare-worker perspectives and comprehensive multivariable analysis. Limitations include purposive selection of service areas and equal recruitment despite differences in patient volume, limiting representativeness. Healthcare workers were purposively selected for contextual triangulation. Only 83 patients were dissatisfied, against 18 predictor parameters, giving approximately 4.6 events per parameter; consequently, some estimates were imprecise and sparse categories were

unstable. Satisfaction was self-reported, based on a single global item, and the original five-point response was dichotomised, reducing ordinal information and precision.

4.10 Implications for Future Research

Future research should use multicentre studies to assess whether these associations are reproducible across Nigerian tertiary hospitals and other levels of care. Longitudinal or repeated cross-sectional designs should evaluate interventions addressing dignity, specialist access, equipment, waiting time, staffing, communication and financial transparency. Larger samples should provide more outcome events for robust multivariable modelling. Patient-reported measures should be combined with objective indicators, including actual waiting time, staffing ratios, specialist availability, equipment functionality, medicine availability and out-of-pocket expenditure. Such evidence would help identify which interventions produce sustained improvements in patient-centred care, service quality and health-system responsiveness, while guiding efficient resource allocation decisions.

CONCLUSION

Patient satisfaction was associated with multiple dimensions of tertiary healthcare delivery. In the final comprehensive model, dignity and respect, access to medical specialists and functional equipment remained independently associated with satisfaction. Patients aged 31–35 years had higher adjusted odds of satisfaction, while post-tertiary education was associated with lower adjusted odds. Department, gender and marital status were not independently associated. Waiting time, communication, staffing, infrastructure and financial factors were significant bivariate correlates but were not independent predictors in the final model. Quality improvement should prioritise respectful care, specialist access and functional equipment while appropriately addressing broader service-process and financial concerns.

Declarations

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Data availability- This manuscript has associated data. The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval and Consent to Participate- Ethical approval was obtained from the University of Ibadan/University College Hospital (UI/UCH) Ethics Review Board (Approval Number: UI/EC/25/0517). The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Informed consent was obtained from all participants before their participation in the study.

Consent for publication- Not applicable.

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AJO & HOA conceived the study, HOA designed and supervised the study, AJO supervised data collection, HOA & AAO reanalysed and interpreted the data, AJO drafted the initial manuscript, HOA & OAI redrafted the manuscript. HOA & HOO reviewed the redrafted manuscripts and prepared the result tables, & HOA wrote the final manuscript. All authors critically reviewed the manuscript, approved the final version, and agree to be accountable for all aspects of the work.

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Figures

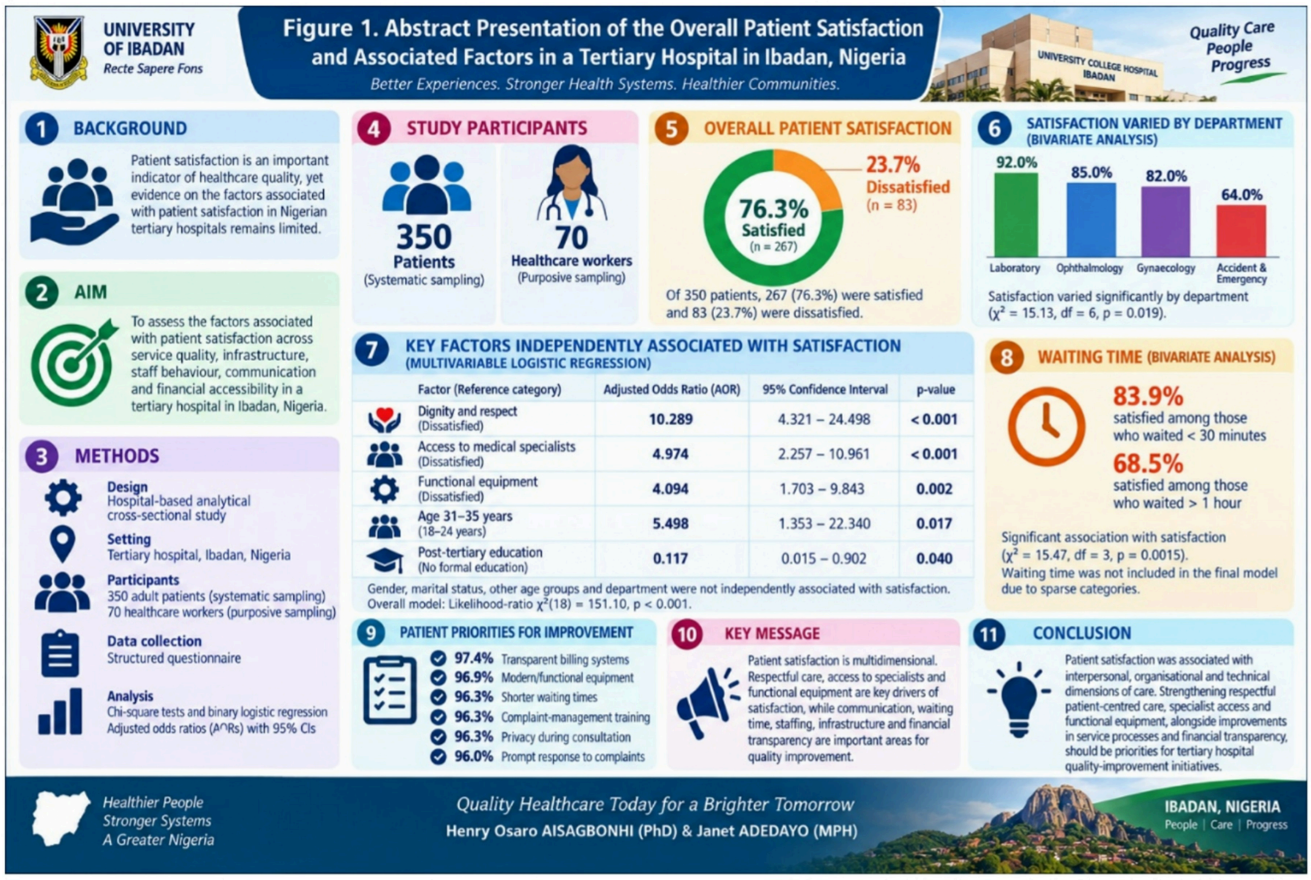


Figure 1

Abstract Presentation of the overall Patient Satisfaction and Associated Factors in a Tertiary Hospital in Ibadan, Nigeria

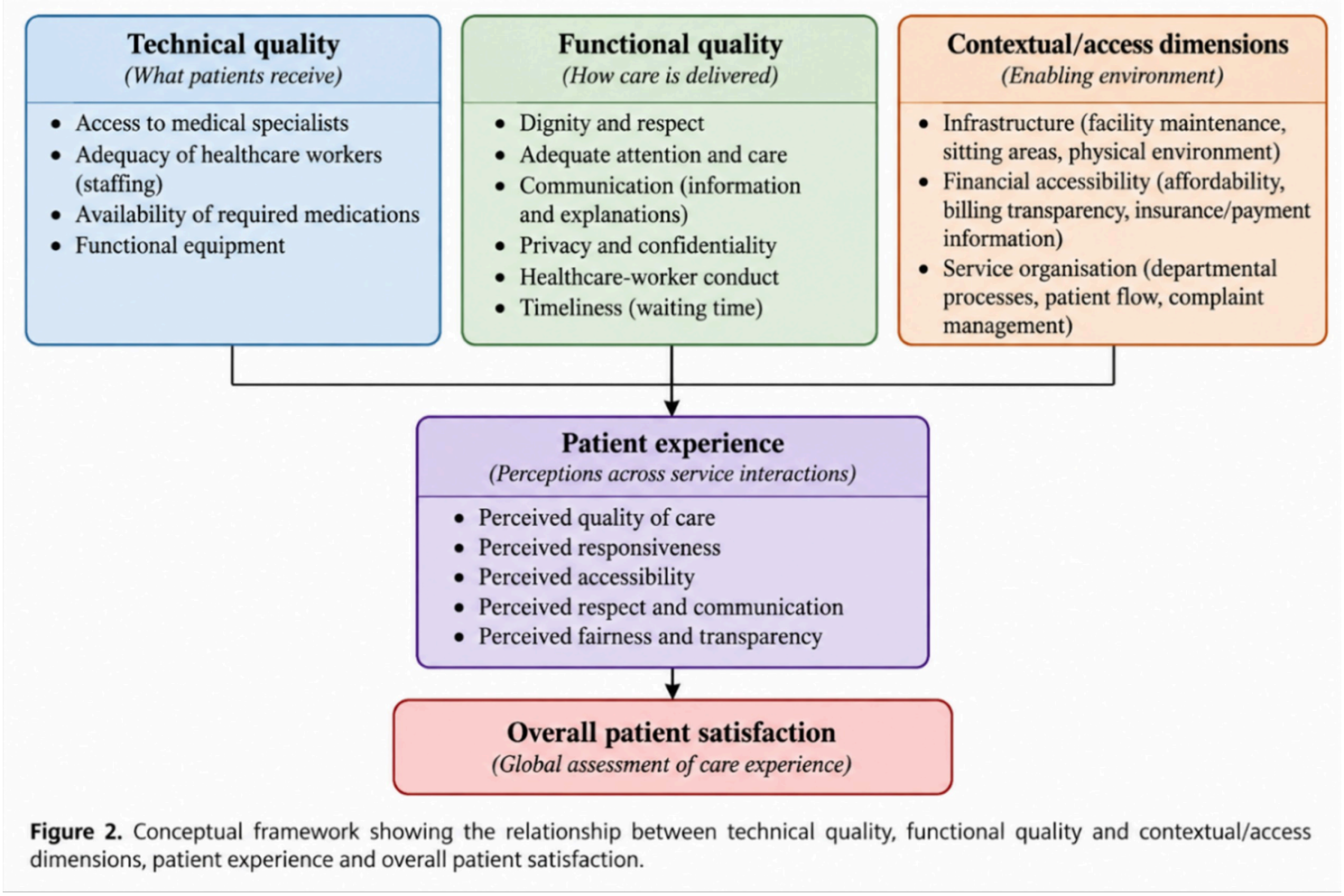


Figure 2. Conceptual framework showing the relationship between technical quality, functional quality and contextual/access dimensions, patient experience and overall patient satisfaction.

Figure 2

See image above for figure legend

Supplementary Files

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- SupplementaryTables.docx