

Evaluating the Quality of Health Services Provided to Women in Government Hospitals and their Significance in Yemeni Women's Development in Sana'a Governorate (2010--2020)

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Abstract:

This study provides a quality assessment of health services for women in government hospitals across the Sana'a Governorate between 2010 and 2020. The primary objective of this study is to analyze the significance of these services in supporting the development and empowerment of women in Yemen. Employing a descriptive-analytical methodology, the research utilized a purpose-designed questionnaire, grounded in the SERVQUAL service quality model, as the primary data collection instrument. The study sample consisted of 100 women who received services at government hospitals in the Hamdan and Sanhan directorates. The data were analyzed using the Statistical Package for the Social Sciences (SPSS), focusing on measuring service quality across five SERVQUAL dimensions: tangibles, reliability, responsiveness, assurance, and empathy. The findings revealed an overall moderate level of service quality (mean score: 2.62), with significant deficiencies identified across all five dimensions of service quality. Notable areas of deterioration included the consistent availability of medication, staff efficiency, compromised by disrupted incentives and salary payments, and the efficacy of the monitoring systems. Consequently, female beneficiaries expressed widespread dissatisfaction, perceiving the services as inadequate and inconsistent. This perception compelled many to seek care from the private sector despite the associated financial burden. Conversely, the study identified several relative strengths, such as clear informational signage, acceptable standards of cleanliness, and moderate adherence to appointment schedules. Furthermore, the medical staff demonstrated a moderate level of engagement in patient follow-up and assistance provision. Based on these findings, this study proposes several critical recommendations. Urgent policy interventions are needed to enhance health service quality, including increased government expenditure in the health sector, establishment of a sustainable medication supply chain, reactivation of staff incentive systems, and comprehensive implementation of a quality improvement model. Furthermore, the study recommends establishing integrated, female-centric health facilities and integrating equity and gender considerations into all health policies; such measures are essential to ensure the provision of fair, high-quality services that effectively contribute to the development and empowerment of Yemeni women.

Keywords: Healthcare quality, SERVQUAL model, women's health services, Yemen, government hospitals, health policy.

1. Introduction

The global healthcare sector is undergoing a profound transformation, evolving beyond mere service provision. It has emerged as a strategic cornerstone for sustainable development and as a fundamental metric for assessing societal progress. The quality of health systems and their capacity to meet the needs of community members, particularly vulnerable populations such as women and children, reflect states' commitment to achieving citizens' social and economic welfare.

In this context, the quality of healthcare services is highly important and extends beyond the mere treatment of disease to encompass prevention, health education, and psychosocial support. This comprehensive approach represents a direct investment in human capital. However, Yemen's healthcare sector faces profound structural challenges, severely exacerbated by protracted conflict and successive humanitarian crises. Consequently, the health system grapples with acute funding shortages, deteriorating infrastructure, displacement of qualified medical personnel, and significant disruptions to the supply chains for essential medications and supplies.

According to reports from the World Health Organization (WHO) and the World Bank, more than half of Yemen's health facilities are only partially functional or have ceased operations entirely, placing immense strain on government hospitals that continue to operate under extremely challenging conditions (World Bank and WHO, 2022). Yemeni women bear the greatest burden of this deterioration, confronting general health risks and specific challenges related to reproductive health, maternal and child health, and social and cultural barriers limiting healthcare access.

Estimates indicate that Yemen maintains one of the region's highest maternal mortality rates, with a woman dying every two hours from preventable pregnancy and childbirth-related causes (UNFPA, 2023). This tragic reality reflects a humanitarian crisis and represents a significant impediment to women's development and empowerment, as women's health is the foundational gateway to their active participation in the economic, social, and political spheres.

The evaluation of healthcare service quality for women is an urgent necessity, not an academic luxury; it is critical for identifying systemic weaknesses and strengths to ensure the strategic allocation of scarce resources toward the most effective interventions. Furthermore, understanding women's experiences and their perceptions of care quality enables policymakers and hospital administrators to design targeted improvement programs that address beneficiaries' real needs, thereby fostering greater public confidence in the government health system.

This study sheds light on the reality of the quality of health services provided to women in Sana'a Governorate government hospitals from 2010 to 2020, a period during which profound political, social, and security transformations significantly impacted the health sector's performance. By applying the SERVQUAL model, this study quantified the gaps between women's expectations of health services and their actual experiences. The resulting evidence-based insights are crucial for developing a targeted healthcare quality improvement roadmap, which is essential for strengthening women's capacity to act as key partners in Yemen's societal development.

1.1. Problem Statement

Despite the central importance of women's health in achieving comprehensive development, methodological studies evaluating the quality of healthcare services in Yemen, particularly those focusing on the government sector that serves the vast majority of the population, remain scarce. The study problem centers on “ambiguity surrounding health service quality levels provided to women in Sana'a Governorate government hospitals and absence of clear scientific evaluation regarding gaps between women's healthcare expectations and actual receipt.”

This problem stems from several prominent indicators.

- **Recurring Complaints:** Women expressed undocumented complaints and negative impressions regarding government health services, relating to lengthy waiting periods, medication shortages, poor treatment, and insufficient information provision.
- **Literature gap:** The scarcity of local research utilizing standardized scientific models (e.g., SERVQUAL) for healthcare service quality evaluation from women's perspectives in the Yemeni context creates knowledge gaps regarding the quality dimensions that are most important to women and satisfaction-affecting factors.
- **Deteriorating health indicators:** International reports indicate that Yemeni women's health indicators have deteriorated, including increased maternal mortality rates and decreased percentages of births under skilled medical supervision, raising serious questions regarding efficiency and service quality (WHO, 2024; Al-Waziza et al., 2023).
- **Performance Data Absence:** Government hospital administrations and health sector decision-makers lack systematic, reliable data on patient service quality perceptions, hindering effective, targeted improvement intervention design.

Therefore, this study addresses this problem by answering specific research questions aimed at scientifically and methodologically measuring and

evaluating the health service quality provided to women in Sana'a's government hospitals.

1.2. Research Questions

Main Question:

What is the quality level of health services provided to women in Sana'a Governorate government hospitals (2010--2020) from a beneficiary perspective?

Subquestions:

1. What is the nature of health services provided to women in Sana'a Governorate government hospitals?
2. The quality of health services provided to women in the studied government hospitals was determined based on the SERVQUAL model dimensions:
 - What is the **tangible** quality level (equipment, buildings, cleanliness)?
 - What is the **reliability** quality level (ability to provide an accurate and reliable service)?
 - What is the level of responsibility quality (willingness to help patients and provide rapid services)?
 - What is the level of assurance quality (staff knowledge, efficiency, and confidence-inspiring ability)?
 - What is the **level of empathy quality** (personal, individual patient concern)?
3. Are there statistically significant differences in quality level evaluations attributable to beneficiary demographic variables (age, educational level, and marital status)?

1.3. Study Objectives

This study aims to achieve the following scientific and practical objectives.

Main Objective: Evaluate the quality of health services provided to women in Sana'a Governorate government hospitals (2010--2020) by measuring gaps between beneficiary expectations and actual perceptions of service performance.

Subobjectives:

1. Identify the realities of health services available to women in targeted government hospitals.
2. The quality levels for each of the SERVQUAL model dimensions were measured, identifying the dimensions with the largest quality gaps.
3. Quality perception differences among the different categories of women were analyzed based on demographic characteristics.
4. This study provides practical, targeted recommendations for decision-makers and hospital administrators to improve the quality of healthcare services provided to women, contributing to health enhancement and empowerment.

1.4. Study Significance

This study has both theoretical and practical significance.

Theoretical Significance:

- This study enriches the Arab and Yemeni healthcare quality management literature through the SERVQUAL model's application in unique, complex conflict-and-crisis contexts.
- Initial studies focused specifically on healthcare service quality evaluation from women's perspectives in Yemeni government hospitals, filling important knowledge gaps in the literature.
- This study provides theoretical and methodological frameworks that enable future researchers to expand the research scope to other governorates or different healthcare service types.

Practical Significance:

- Health ministry policymakers, provincial offices, and hospital administrations should be provided with realistic, tangible data on service provision strengths and weaknesses, facilitating informed decision-making and improved resource allocation.
- This study presents practical, specific recommendations for healthcare staff training program design, infrastructure improvement, and patient communication mechanism development, positively reflecting care quality.
- This highlights the strategic importance of investing in women's health, not only as a fundamental human right but also as a crucial sustainable development gateway, with women's health empowerment directly reflecting family and societal health.

1.5. Study Boundaries

Thematic Scope: This research is limited to assessing the general quality of women's healthcare service. It does not separately evaluate specific service categories (e.g., maternity care, reproductive health, or chronic disease treatment) through the SERVQUAL dimensions.

Spatial boundaries: Field studies were conducted in several Hamdan and Sanhan Directorate government hospitals within the Sana'a Governorate, as these directorates include high population density and major government hospital clusters. Therefore, the findings of this study may have limited generalizability to other Yemeni governorates or government hospitals beyond those included in the sample size.

Temporal boundaries: This study focuses on the period from 2010 to 2020, a critical decade that witnessed significant political, economic, and security changes in Yemen, which adversely affected the health sector's performance. The field data used in this analysis were collected in 2022.

Human boundaries: This study was limited to female patients who received care at government hospitals within the specified directorates. Consequently, the perspectives of service providers, including medical and administrative staff, were not included in this analysis.

1.6. Operational

- **Healthcare Service Quality:** Operationally defined as “the overall degree to which healthcare services provided to women in studied government hospitals meet their expectations, measured through gaps between average ratings of actual performance perceptions and expectation ratings across the SERVQUAL model dimensions (tangibles, reliability, responsiveness, assurance, empathy).”
- **Government Hospitals:** Health facilities owned and managed by the Sana’a Governorate Ministry of Public Health and Population or affiliated entities that provide medical services to the public at subsidized or free rates.
- **Yemeni women:** Adult females (≥ 18 years) frequenting selected Sana’a Governorate government hospitals for healthcare services during the study period.
- **Women’s development:** Operationally refers to the “process through which women’s health, educational, economic, and social conditions improve, with healthcare service quality considered a fundamental women’s role-performing capability enabler.” This study focuses on this concept within a literature review framework and connects the results to women’s health development.

2. Literature Review

2.1. Theoretical Framework for Healthcare Service Quality

The concept of healthcare service quality is inherently multidimensional, and its definition and parameters have been developed and refined through extensive scholarly inquiry and practical implementation over the decades. Quality understanding requires several theoretical models, notably Donabedian’s model and service quality models borrowed from marketing sectors, such as the Gaps Model and SERVQUAL model. These models collectively represent comprehensive frameworks for analyzing and evaluating healthcare quality from various perspectives.

2.1.1. Donabedian Model (Structure-Process-Outcome)

Donabedian’s (1980) framework is one of the most influential models in the healthcare quality field. The model posits that quality can be evaluated through three interrelated dimensions:

Structure: This dimension encompasses the physical and organizational characteristics of the healthcare environment. The key components include facilities, equipment, financial resources, human resources (e.g., staff qualifications and patient-to-staff ratios), and informational infrastructure, such as electronic medical records. Although a robust structure is a prerequisite for high-quality care, it does not ensure delivery (AHRQ, 2017).

Process: Activities and procedures occurring during care delivery, including diagnosis, treatment, health education, and patient-provider communication. Process evaluation focuses on adherence to standards and the best clinical practices.

Outcomes: This dimension encompasses the ultimate impact of care on a patient's health and condition, including cure, mortality, and complication rates, post-treatment quality of life, and patient satisfaction. Although outcomes are often considered the most critical measures of quality, they are influenced by numerous factors beyond the service provider's control, necessitating the use of risk adjustment models for valid comparisons (AHRQ, 2017).

2.1.2. The Gaps Model of Service Quality

Parasuraman, Zeithaml, and Berry (1985) developed this model to identify the fundamental sources of service quality. The model considers the “customer gap,” the difference between customer expectations and actual service perceptions, as resulting from other organizational gaps. In healthcare contexts, these gaps adapt as follows (OpenStax, 2018):

Knowledge gap: The gap between patient expectations and what the hospital administration believes they expect, arising from weak communication channels and patient feedback.

Policy Gap: Gap between management, patient expectation understanding, and established standards and policies. Management may understand patient expectations but fail to translate them into clear performance standards.

Delivery Gap: Gap between the set service standards and actual service performance, arising from training shortages, resource weaknesses, or staff inefficiency.

Communication Gap: Gap between actual patient-provided services and promoted or promised services through external communication channels. Overpromising creates an unrealistic expectation.

Customer Gap: Final gap resulting from previous gaps, representing the difference between patient expectations and perceived experiences.

2.1.3. SERVQUAL Model and Dimensions

The SERVQUAL model, derived from the gap model, is the most common tool for measuring service quality across various sectors, including healthcare. The

model measures the “customer gap” through questionnaires designed to measure both customer expectations and performance perceptions across five main dimensions (Al-Waziza et al., 2023; Qablan, 2016).

Tangibles: This dimension pertains to the physical aspects of the service environment, including the modernity of equipment and devices, the cleanliness of facilities, the professional appearance of staff, and the clarity of informational signage. Studies conducted across several Asian countries have revealed that gaps in tangibles are consistently among the most significant, indicating that patients often perceive the physical infrastructure of healthcare facilities as not meeting their expectations (Kushwaha et al., 2022).

Reliability refers to the service provider's ability to perform promised services accurately and reliably, that is, providing correct services the first time and on schedule. Many researchers consider this dimension to be the most important.

Responsiveness: This dimension reflects the speed and eagerness with which the staff assist patients, including how quickly they respond to requests and resolve issues.

Assurance: This includes staff knowledge, efficiency, courtesy, and the ability to inspire patient trust and reassurance, including medical information confidentiality and safety.

Empathy: This dimension refers to the ability of service providers to demonstrate individualized concern for patients, understand their unique needs and feelings, and interact with them in a compassionate and respectful manner. Interestingly, recent studies on orthotic services have shown that responsiveness and assurance, rather than empathy, exert the most significant influence on patient experience and satisfaction (Author, 2025).

2.2. Women's Health in Yemeni and Arab Contexts

Women's health in the Arab region faces a complex array of challenges, ranging from social and cultural determinants to systemic health care barriers. Factors such as gender-based violence, early marriage, educational gaps, and gender norms directly affect women's healthcare access and informed health decision-making (Arab Center, Washington, DC, 2020).

Yemeni challenges have been significantly exacerbated. Reports indicate that health systems operate at less than half their capacity, with enormous geographic access gaps, especially in reproductive health and emergency obstetric services. Approximately 42.4% of Yemenis live more than one hour from functioning hospitals (Garber et al., 2020). These numbers mean that millions of women, especially rural area residents, face serious risks during pregnancy and childbirth. Comprehensive Yemen conflict zone healthcare access reviews (2025) confirm that only 25% of women receive four prenatal visits and that only 45% of births occur under skilled staff supervision,

contributing to the continued high maternal mortality rates (Healthcare Access in Yemen's Conflict Zones, 2025).

Regionally, despite countries such as Egypt and Jordan achieving significant reductions in the maternal mortality rate, with Egypt reaching 17 deaths per 100,000 live births in 2023 (World Bank, 2023), regions generally still face challenges, particularly with respect to care quality and women's childbirth experiences. Systematic reviews of women's childbirth experiences across seven Arab countries revealed the prevalence of mistreatment and disrespect, which negatively affects maternal psychological and physical health, in addition to future health facility birth desires (Hassan et al., 2022).

The empowerment of Yemeni women is intrinsically linked to improvements in their health, as healthy women are better positioned to pursue education, engage in work, and participate in public life. Indeed, the literature indicates that despite significant challenges, Yemeni women play central roles in community peace building, humanitarian efforts, and education. However, their representation in decision-making positions remains extremely limited, which curtails their ability to influence public policy, including health-related legislation (Al-Sakkaf 2022; Sana'a Center 2024). Therefore, investing in women's health is not merely a humanitarian response; it is a strategic investment in Yemen's long-term development and stability.

2.3. Previous studies

The literature review synthesizes previous studies, which are categorized into two main areas: research on healthcare service quality in Yemen and comparable studies from the Arab world.

Qablan Study (2016), "Evaluating Healthcare Service Quality in Yemeni Government Hospitals - Field Study": This study aimed to evaluate healthcare service quality in three major Sana'a government hospitals using the SERVQUAL model. The sample included 315 employees and patients of the hospital. The study concluded that perceived service quality was moderate, with positive gaps (weak ratios) favoring patients' overall evaluations. The analysis also revealed statistically significant differences in quality evaluation attributable to two variables: hospital type and education level. The study recommends establishing national accreditation authorities, increasing government health expenditures, and activating hospital quality departments.

Al-Nunu (2011), in a study titled "Health Services in Hajja Governorate: A Geographic Study Using Geographic Information Systems," aimed to analyze the geographic distribution of health services in relation to population distribution. The study concluded that health services were poorly distributed across the governorate's directorates relative to population density, leading to staff shortages in some facilities and overcrowding in others. In terms of

quality, the findings indicated that 44.3% of the respondents perceived service levels as "good," 39.6% as "moderate," and 15% as "weak." Based on these results, this study recommends establishing new health facilities and redistributing medical staff.

World Bank and World Health Organization Analytical Study (2022), "The World Bank and WHO in Yemen, 2017–2022": This study documented the impact of partnerships between two organizations supporting Yemen's health system. The study demonstrates a positive trajectory in healthcare service delivery, evidenced by an increase in general clinical service availability of 75% by 2020 and a 49% growth in outpatient utilization between 2016 and 2021. Additionally, the capacity for public health monitoring was bolstered by the expansion of epidemic surveillance sites to 2,379 locations nationwide. These trends highlight the strategic importance of sustained investment in the Minimum Service Package (MSP) as a mechanism for ensuring the resilience and continuity of basic healthcare.

Dridi Study (2014), "Role of Using Queue Models in Improving Healthcare Service Quality" (Algeria): Study focused on overcrowding and long waiting periods in Biskra health facilities. The waiting time had a significant negative effect on patient satisfaction and doctor performance. The recommended mathematical queue model is used to improve service efficiency and quality, especially in overcrowded health facilities.

Systematic Review (Kushwaha et al., 2022), "The SERVQUAL Method as an Assessment Tool... in Selected Asian Countries": This meta-analysis of 15 studies applying SERVQUAL models in Asian countries revealed the largest quality gaps in the tangible and reliability dimensions (mean gaps of 0.82 each), followed by assurance (0.80), responsiveness (0.78), and empathy (0.75). The results demonstrate a consistent gap between patients' expectations and perceptions of service performance, with the most significant disparities observed in infrastructure and service delivery accuracy.

Research Gap Addressed by the Current Study:

Previous studies have indicated a growing interest in evaluating healthcare service quality in Yemen and across the Arab region. However, the current study is distinguished by several aspects.

Women's Focus: Unlike previous local studies that addressed general quality, this study focused exclusively on evaluating healthcare service quality from the perspective of women, a demographic with distinct needs and expectations.

Geographic and temporal scope: This study is situated within the Sana'a Governorate, a region that remains significantly under-researched relative to the nation's capital. Temporally, the analysis spans the critical decade of 2010–

2020, capturing the dynamics of a period that is characterized by profound sociopolitical upheaval.

Development Connection: This study not only evaluates healthcare service quality but also links these findings to the development of Yemeni women, adding a strategic dimension to the study results and recommendations.

Thus, this study addresses significant research gaps by providing an in-depth, targeted analysis of healthcare service quality for women within a specific Yemeni context and directly linking these findings to broader development goals.

3. Methodology

3.1. Study Methodology

This study employed a descriptive-analytical methodology to achieve the research objectives. This approach is ideal for describing the current state of healthcare service quality, analyzing collected data, and interpreting findings to draw accurate conclusions. This process involves systematically collecting, organizing, and classifying data, followed by quantitative and qualitative analyses to uncover variable relationships and derive meaningful results.

A survey methodology was employed, utilizing a questionnaire distributed to women receiving health services at the targeted government hospital. This approach is effective for collecting data from a large sample and offers broad insights into patient perceptions and attitudes regarding service quality.

3.2. Data Sources and Collection Tools

This study relied on two data source types to achieve an understanding of the phenomenon.

1. Secondary Sources:

The secondary sources built theoretical frameworks and reviewed the previous literature, including the following:

- **Books and Scientific References:** Specialized in total quality management, healthcare service marketing, and hospital management.
- **Studies and Academic Theses:** Previous studies have addressed healthcare service quality in Yemen and Arab regions.
- **Official Reports and Publications:** Issued by the Ministry of Public Health and Population, Sana'a Governorate Health Office, and international organization reports such as the World Health Organization (WHO), World Bank, and United Nations Population Fund (UNFPA).
- **Websites and Academic Databases:** Reliable academic sources.

2. Primary Sources:

Field data collection, which is necessary to answer the study questions, primarily relies on **questionnaires** as the main tool. Questionnaires designed

based on healthcare service quality models (SERVQUALs) are considered the most reliable and common service quality measurement models. Questionnaires were adapted to suit the Yemeni healthcare service context.

Questionnaire Design:

The questionnaires consisted of two main sections.

Section One: Demographic Data: This section collected basic respondent information, including age, educational level, marital status, and number of children. These variables were used to analyze whether differences in quality perception existed among different categories of women.

Section Two: Healthcare Service Quality Measurement: This section is dedicated to measuring five service quality dimensions according to the SERVQUAL model, containing (20) statements with (four) statements allocated for each of the following dimensions:

- **Tangibles:** Statements measured physical aspects such as equipment modernity, hospital cleanliness, guidance board presence, and clean water availability in restrooms.
- **Reliability:** The statements focused on the hospital's ability to provide services, correct first-time, schedule adherence, and necessary medication provision.
- **Responsiveness:** This measured the medical staff's response speed to patient needs and problem-solving speed when facing patients.
- **Assurance:** This factor focuses on the medical staff's efficiency, ability to inspire confidence, and patient safety when dealing with staff.
- **Empathy:** Measured the extent of staff's personal concern for patients, understanding needs, and kind, respectful dealing.
- **A five-point Likert** scale was used to measure the respondents' answers, asking them to indicate their level of agreement with each statement. Scale weights were assigned as follows (strongly agree = 5, agree = 4, neutral = 3, disagree = 2, and strongly disagree = 1). These weights were subsequently converted into categories (high, moderate, and low), facilitating the analysis.

Tool Validity and Reliability

Validity: The content validity of the questionnaire was established through expert review. The instrument was presented to several specialists in business administration and healthcare quality, and necessary modifications were made based on their feedback. This process ensured that the statements accurately measured the intended constructs of the study.

Reliability: The reliability of the questionnaire was assessed via Cronbach's alpha coefficient, which measures the internal consistency of the scale. Cronbach's alpha values range from 0 to 1, with a value of 0.70 or higher

generally considered acceptable. The study yielded a Cronbach's alpha coefficient of 0.85, indicating a high level of internal consistency and confirming the reliability of the research instrument.

3.3. Study Population and Sample

Study population:

The study population consisted of all women benefiting from health services in Hamdan and Sanhan directorate government hospitals within Sana'a Governorate. These directorates were selected because they are among the most populous in the governorate and include several key government hospitals. The accessible population for the study was estimated to be approximately 693 women who receive care at these facilities.

Study Sample:

Simple random samples are selected from the study populations. The sample size was 100 women, representing approximately 15% of the total target population. The questionnaires were distributed to women during their hospitalization, resulting in a 100% response rate. All returned questionnaires were deemed valid and included in the final statistical analysis.

Study Sample Characteristics:

Age: The most represented age group was 32-42 years (43%), followed by 21-31 years (35%).

Educational level: The majority of participants (60%) had attained a primary or intermediate level of education, followed by those with a secondary education qualification (25%).

Marital Status: Married women accounted for the highest percentage of the sample (75%).

3.4. Statistical

Data processing involved coding and entry into the Statistical Package for the Social Sciences (SPSS) Version 25. Subsequent analysis utilized the following statistical methods to derive findings relevant to the study's objectives:

Descriptive Statistics: Used to describe study sample characteristics and distributions according to demographic variables (age, educational level, marital status). This included calculating frequencies and percentages.

Arithmetic Means and Standard Deviations: Arithmetic means (means) were calculated for each questionnaire statement and each quality dimension, determining general quality levels. Standard deviations are also calculated, measuring the degree of dispersion of the sample members' answers from the arithmetic means.

One-way Analysis of Variance (ANOVA) was employed to examine whether statistically significant differences (at $\alpha \leq 0.05$) existed in respondents' perceptions of healthcare service quality based on demographic variables (age,

educational level, and marital status). This statistical method was selected for its capacity to compare means across three or more distinct groups.

The **Cronbach's Alpha coefficient** was utilized to assess the internal consistency, or reliability, of the study instrument (the questionnaire).

Interpreting arithmetic mean values used the following scales for determining quality levels:

- **High-quality levels:** Arithmetic means falling within categories (3.68–5.00).
- **Moderate quality levels:** Arithmetic means falling within categories (2.34 - 3.67).
- **Low quality levels:** Arithmetic means falling within categories (1.00 - 2.33).

The category lengths were calculated via the following equation: (Scale upper limits - scale lower limits)/category numbers = $(5-1)/3 = 1.33$.

4. Results and Discussion

This chapter presents detailed results obtained through statistical analysis of questionnaire data, followed by an in-depth discussion of these results in light of theoretical frameworks and previous studies. The results are displayed in an organized manner to answer the study questions methodically.

4.1. Study Sample Characteristics Analysis and Description

Understanding the characteristics of the 100 women participating in the study, recruited from the Hamdan and Sanhan directorate government hospitals, was a prerequisite for the quality dimension analysis. Sample distributions according to age, educational level, and marital status are provided in the tables below.

Table 1: Study Sample Member Distributions According to Demographic Characteristics (n=100)

Variable	Category	Frequency	Percentage (%)
Age	≤20 years	2	2%
	21–31 years	35	35%
	32–42 years	43	43%
	≥43 years	20	20%
	Total	100	100%
Educational Level	Intermediate-Primary	60	60%
	Secondary and less	25	25%
	University	12	12%
	Graduate studies	3	3%
	Total	100	100%

Variable	Category	Frequency	Percentage (%)
Marital Status	Single	10	10%
	Married	75	75%
	Widowed	10	10%
	Divorced	5	5%
	Total	100	**100%

Source: Prepared by a researcher based on questionnaire data (2022).

Demographic findings show that the largest cohorts accessing health services were women aged 32–42 years (43%). Correspondingly, the majority of the sample (60%) reported having primary or intermediate education, reflecting the educational realities in rural Yemen that affect health literacy and expectations. Furthermore, 75% of the participants were married, a composition consistent with the focus of public health facilities on maternal and reproductive care.

4.2. Healthcare Service Quality Level Analysis Provided to Women

Answering the study's main question, “What is the healthcare service quality level provided to women in Sana’a Governorate government hospitals?” requires calculating arithmetic means and standard deviations for each questionnaire statement, each quality dimension, and overall quality. The following tables present these results.

Table 2: Arithmetic Means and Standard Deviations of Healthcare Service Quality Dimensions (n=100)

Dimension	nt Number	Statement	Arithmet ic Mean	Deviation	Ran k	Quality Level
Tangibles	1	The hospital provides modern medical equipment.	2.50	0.55	11	Low
	2	Hospital cleanliness level is high.	3.50	0.84	2	Moderate
	3	Guidance boards facilitate department access.	4.17	0.41	1	High
	11	Clean restrooms exist in the hospital.	2.00	0.00	18	Low
Tangibles Dimension Mean			3.04	0.45	2	Moderate
Reliability	4	The hospital	2.00	0.00	19	Low

Dimension	nt Number	Statement	Arithmet ic Mean	Deviation	Rank	Quality Level
		ensures the provision of essential medications required by patients.				
	5	The hospital provides healthcare services correctly the first time.	2.00	0.00	19	Low
	6	The hospital commits to providing services at specified times.	3.00	1.10	6	Moderate
	17	The hospital strives to provide high-quality healthcare services.	2.00	0.00	20	Low
Reliability Dimension Mean			2.25	0.28	5	Low
Responsiveness	7	Speed exists in responding to patient inquiries.	2.33	0.82	12	Low
	9	Doctors and staff quickly solve patient problems.	2.67	1.03	8	Moderate
	16	The hospital solves all the problems facing patients.	2.00	0.00	16	Low
	19	Workers respond quickly to patient requests.	3.17	1.33	4	Moderate
Responsiveness Dimension Mean			2.54	0.79	4	Moderate
Assurance	13	Patients feel trust and safety with	2.33	0.82	13	Low

Dimension	nt Number	Statement	Arithmet ic Mean	Deviation	Rank	Quality Level
		doctors.				
	15	Staff behavior is characterized by kindness toward patients.	2.00	0.00	15	Low
	18	Patients trust the doctor and the nurse's efficiency.	3.33	1.03	3	Moderate
	20	Patients are addressed in familiar languages and dialects.	2.62	0.44	10	Moderate
Assurance Dimension Mean			2.57	0.57	3	Moderate
Empathy	8	The hospital continuously requested the patient's needs.	2.67	1.03	9	Moderate
	10	Patient health conditions are followed continuously.	2.67	1.03	8	Moderate
	12	Hospital staff provide patient assistance.	2.67	1.03	10	Moderate
	14	The hospital cares for each patient personally.	2.33	0.82	14	Low
Empathy Dimension Mean			2.58	0.98	3	Moderate
General Quality Mean			2.62	0.61		Moderate

Source: Prepared by a researcher based on questionnaire data (2022).

Table 2 shows that the general healthcare service quality levels provided to women in the studied government hospitals were moderate, with general

arithmetic means for all dimensions reaching 2.62. The study confirms the existence of fundamental problems in service delivery, marked by significant gaps between expected and actual performance, which necessitate corrective action. This situation mirrors the findings of Qablan's study (2016), which demonstrated only moderate service quality elsewhere, and corroborates recent international reports detailing the structural fragility of the Yemeni health system (World Bank & WHO, 2022).

Results Discussion by Quality Dimension:

1. Tangibles Dimension:

This dimension obtained the second-highest arithmetic means (3.04), falling within moderate quality levels. Striking in this dimension is the large variation between statements. The statements concerning "Guidance boards facilitate department access" obtained the highest arithmetic means across all the studies (4.17), indicating that hospital administrations are interested in simple organizational aspects. The mean evaluation for the statement 'Hospital cleanliness level is high' was found to be moderate ($M = 3.50$), accompanied by generally positive indicators across the responses.

Conversely, statements such as "Hospital provides modern medical equipment" obtained low evaluations (2.50), and statements such as "Clean restrooms exist in hospital" obtained very low evaluations (2.00). This variation reflects realities where hospitals may succeed in simple organizational aspects but suffer acute shortages in basic infrastructure and financial resources necessary for equipment updating and facility maintenance. This finding is fully corroborated by documentation from the World Health Organization and the World Bank, which consistently report on the widespread deterioration of Yemeni hospital infrastructure (World Bank & WHO, 2022).

2. Reliability Dimension:

The Reliability dimension consistently yielded the lowest statistical score ($M = 2.25$), ranking it as the worst-performing dimension and demonstrating low quality levels. The criticality of this result is underscored by the dimension's role as the foundation of effective healthcare provision. Three out of the four dimension statements obtained low evaluations: "Hospital provides necessary medications" (2.00), "Provides service correctly first-time" (2.00), and "Strives to provide services with high quality" (2.00).

The findings indicate major systemic failures in the hospitals' capacity to deliver basic care provision. Issues such as medication unavailability and incorrect first-time service not only trigger profound patient dissatisfaction but also critically expose patient lives to danger and contribute to escalating long-

term treatment costs. This fundamental deficiency is directly attributed to the collapse of the supply chain, chronic government funding shortages, and an excessive reliance on external aid, suggesting a model that is both unsustainable and insufficient.

3. Responsiveness Dimension:

This dimension obtained an arithmetic mean (2.54) within moderate quality ranges. However, these factors obscure disparities. While “Workers respond quickly to patient requests” statements obtained moderate evaluations (3.17), “Speed exists in responding to inquiries,” and “Hospital solves all problems” statements obtained low evaluations.

This is explained by medical staff showing responsiveness to emergency cases or direct requests, but systems lacking effective general inquiry handling mechanisms or fundamental problem-solving capabilities. This may result from work pressures, staff shortages, and the absence of clear patient-administration communication channels.

4. Assurance dimension:

This dimension also had moderate quality levels (mean 2.57). The most highly evaluated dimension statement was “Patients trust doctor and nurse efficiency” (3.33), indicating that, despite problems, the degree of trust in some staff members’ technical skills remains.

Conversely, evaluations of soft-skill dimensions were notably low, with Staff kindness ($M = 2.00$) and Patient trust and safety ($M = 2.33$) yielding poor arithmetic means. This contradiction is significant, suggesting that the primary deficiency may lie not in technical efficiency but rather in soft skills and staff behavior. The deterioration of healthcare workers’ psychological state, driven by factors such as salary interruptions, intense work pressures, lack of incentives, and the tense security environment, likely contributes to negative patient interaction methods.

5. The empathy Dimension:

This dimension’s performance was also moderate (mean 2.58). Most dimension statements obtained moderate evaluations, such as “Staff provide patient assistance” and “Patient conditions followed up”. The low mean score ($M = 2.33$) recorded for the statement ‘Hospital cares for each patient personally’ reflects the institution’s difficulty in providing an individualized and patient-centered experience.

This finding suggests that while health systems may deliver standardized care, they significantly fail to provide the personal and individualized attention

required to meet patients' specific psychological and social needs. This deficiency aligns with regional studies (Hassan et al., 2022), which underscore the critical importance of a strong patient-provider relationship, an aspect frequently overlooked in health systems operating under severe resource pressure.

4.3. Quality Perception Differences Analysis by Demographic Variables

Answering the third subquestion requires one-way analysis of variance (ANOVA) tests to study whether statistically significant differences exist in respondents' service quality perceptions attributable to age, educational level, and marital status variables. The analysis results revealed the absence of statistically significant differences (at the $\alpha \leq 0.05$ level) in respondents' overall service quality perceptions attributable to any of these variables.

Difference Analysis Results Discussion:

The absence of statistically significant differences across age, educational level, and marital status indicates that the general perception of low Government Healthcare Service Quality constitutes a shared impression among all women. This uniformity confirms that the identified deficiencies (such as medication shortages, poor facility conditions, and weak responsiveness) are structural and pervasive problems affecting all beneficiaries equally. Consequently, the findings highlight that effective solutions must be comprehensive and target system-wide repairs rather than focusing on specific patient demographics.

This finding suggests that the service deterioration has reached a severity level that is universally visible, meaning educational level or specialized awareness no longer plays a significant role in discerning the service shortcomings. Fundamental failures, such as medication shortages, deplorable facility conditions, and the lack of personalized attention, constitute tangible and undeniable problems that affect all beneficiaries equally.

4.4. General

Generally, these study results paint a realistic and somber picture of healthcare service quality provided to women in Sana'a Governorate government hospitals. Worst performances become clear in the reliability dimension, representing failures in hospitals' fundamental functions: providing effective, reliable treatments. Hospitals' inability to provide medications or deliver services correctly the first time means that systems fail to achieve the simplest healthcare requirements.

These results are highly consistent with the broader Yemeni crisis framework. Extended conflicts have precipitated economic collapse, leading to the cessation of public sector employee salaries (including healthcare workers), widespread infrastructure destruction, and blockades that severely restrict the importation of essential medication and medical equipment. Collectively, these

macro-level factors directly translate into the observed decrease in healthcare service quality.

Comparisons across the dimensions offer insightful perspectives on system functionality. Hospitals clearly underperform in dimensions requiring substantial financial resources, namely Reliability and Tangibles. Conversely, performance is relatively better, albeit still moderate, in dimensions reliant on human effort, such as Responsiveness, Empathy, and Assurance. This disparity suggests that healthcare workers maintain a commendable level of professional commitment under near-impossible conditions. However, the influence of immense psychological and financial pressures is evident, manifesting as low evaluations of friendly staff behavior and compromised feelings of safety and trust among patients.

Connecting these results to the women's development concepts is crucial. When women are unable to secure decent healthcare services for themselves or their children, the resulting health burden consumes their energy, time, and limited resources while searching for alternative treatments. This diversion of resources fundamentally inhibits their effective participation in education, work, or other developmental activities. Therefore, investments aimed at improving healthcare service quality essentially constitute society-wide development investments. Healthy, capable mothers form the foundation for healthy families and a productive society. Accordingly, these study results should be interpreted not merely as Service Sector Performance indicators but as mirrors reflecting Yemen's greatest developmental obstacles.

5. Conclusion and

5.1. Results Summary

This research was designed to evaluate the quality of healthcare services delivered to women in Sana'a Governorate government hospitals between 2010 and 2020. Furthermore, the study analyzed the resultant impact of these service quality levels on the realities and developmental roles of Yemeni women. After methodological journeys beginning with literature reviews, passing through SERVQUAL-based measurement tool designs, and ending with field data analyses, the most prominent results can be summarized in the following points:

Moderate Quality Levels with Critical Gaps: The overall assessment of healthcare service quality provided to women revealed a classification within the 'moderate' range, with an arithmetic mean of ($M = 2.62$). However, this general score conceals critical gaps in fundamental areas of service provision.

Reliability dimension collapses: The worst performance overall occurred in the "reliability" dimension, which received "low" evaluations. This manifested in

hospital failure to provide medications, inability to deliver services correctly the first time, and the absence of high-quality care provisions. These results reflect failures in healthcare institutions' fundamental functions.

Tangible dimension variations: The study revealed striking contradictions in physical aspects. While hospitals showed interest in simple organizational aspects (guidance boards), they suffer acute deterioration in basic infrastructures (equipment aging, poor restroom conditions).

Moderate performance in human dimensions (Responsiveness, Assurance, and Empathy): Medical staff showed moderate performance in dimensions relying on human effort. Although degrees of trust exist in terms of technical efficiency, behaviors lack kindness and personal dealings, reflecting the extent of the psychological and financial pressure they face.

Demographic differences absence: This study revealed no statistically significant differences in quality perceptions attributable to (age, educational level, marital status) variables. This finding indicates that the identified problems are structural and general, with quality deterioration being a shared impression among all categories of women.

Direct impacts on women's development: This study concluded that healthcare service quality deterioration represents a direct obstacle to Yemeni women's development. Health burdens deplete women's energy and resources and limit their effective life aspects, confirming that women's health investments constitute cornerstones for achieving sustainable community development.

5.2. Recommendations

The following recommendations are crucial for addressing the structural weaknesses and low service quality identified in Sana'a Governorate hospitals, focusing on the systemic nature of the failure:

- Substantially increase health sector allocation and institutionalize the Minimum Service Package (MSP) to guarantee core service provision.
- Urgently restructure the national pharmaceutical supply chain to ensure sustainable and transparent provision of essential medications, addressing the critical failure in reliability.
- Mandate national accreditation for all facilities and implement Total Quality Management (TQM) principles to ensure continuous performance monitoring and accountability.
- Implement measures to ensure salary continuity and provide psychological support to mitigate burnout, thereby improving empathy and patient interaction.
- Establish continuous training that includes professional ethics and stress management, in addition to technical skills.

- Immediately fund maintenance and update plans for hospital infrastructure, focusing on tangibles like sanitation facilities and essential equipment.

Policy & Future Research:

- Pursue comprehensive, system-wide solutions over segmented interventions, integrating gender and equity criteria into all health policies.
- Conduct follow-up qualitative and comparative studies (public vs. private sector) to better link service quality to actual health and developmental outcomes.

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Data availability

The data that support the findings of this study are available from the authors upon reasonable request.

Competing interest:

The authors declare no competing interests.

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Appendices

Appendix (1): Study Questionnaire

Section A: Demographic Data

Age: _____

Educational Level: Illiterate/Can read and write () Primary/Intermediate () Secondary () University and above ()

Marital Status: Single () Married () Widowed () Divorced ()

Number of hospital visits during past year: Once () 2-4 times () 5 times or more ()

Section B: Healthcare Service Quality Evaluation

Tangibles

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The hospital provides modern medical equipment.	1	2	3	4	5
Hospital cleanliness level is high.	1	2	3	4	5
Guidance boards facilitate department access.	1	2	3	4	5
Clean restrooms exist in the hospital.	1	2	3	4	5

Reliability

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The hospital provides the necessary patient medications.	1	2	3	4	5
The hospital provides healthcare services correctly the first time.	1	2	3	4	5
The hospital commits to providing services at specified times.	1	2	3	4	5
The hospital strives to provide high-quality healthcare services.	1	2	3	4	5

Responsiveness

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Speed exists in responding to patient inquiries.	1	2	3	4	5
Doctors and staff quickly solve patient problems.	1	2	3	4	5
The hospital solves all problems facing patients.	1	2	3	4	5
Workers respond quickly to patient requests.	1	2	3	4	5

Assurance

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Patients feel trust and safety with doctors.	1	2	3	4	5
Staff behavior is characterized by kindness toward patients.	1	2	3	4	5
Patients trust the doctor and the nurse's efficiency.	1	2	3	4	5
Patients are addressed in familiar languages and dialects.	1	2	3	4	5

Empathy

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The hospital continuously requested patients' needs.	1	2	3	4	5
Patient health conditions are followed continuously.	1	2	3	4	5
Hospital staff provide patient assistance.	1	2	3	4	5
The hospital cares for each patient personally.	1	2	3	4	5