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# CHARACTERIZING QUALITY HEALTHCARE SERVICES IN PUBLIC HOSPITALS USING EXPLORATORY FACTOR ANALYSIS

Rosalyn De Jesus Pamplona<sup>1</sup>, Helen L. Querubin, DSD<sup>2</sup>

<sup>1</sup>(Professional School/University of Mindanao, Bolton Street, Davao City, 8000, Philippines) <sup>2</sup>(Professional School/University of Mindanao, Bolton Street, Davao City, 8000, Philippines)

**ABSTRACT:** This study aimed to identify the factors influencing the quality of health services in public hospitals in the SOCCSKSARGEN region using a mixed-method approach, survey, and exploratory factor analysis (EFA). A researcher-made instrument, pretested for reliability and validity, was used to collect data. The survey involved 250 respondents, while thematic analysis included 30 key informants. Findings revealed three crucial factors influencing patient satisfaction. The first, financial/billing and emotional aspects, accounted for 35.858% of the total variance, shaping patient perceptions. The second, operational factors like waiting time and hospital cleanliness, contributed 49.95%. The third, comfort and accessibility—including staffing, training, space, and equipment—accounted for 34.35%, accumulating to 45.138% of total variance. The KMO Measure of Sampling Adequacy (0.933) and Bartlett's Test confirmed data suitability. Model path analyses showed full and partial mediation effects between healthcare quality components and patient satisfaction. Seven major themes emerged from the qualitative data, leading to recommendations: improve financial assistance and billing transparency, reduce waiting times, enhance cleanliness, increase patient-provider interaction, upgrade facilities, and ensure emergency systems and parking availability. These findings underscore that healthcare quality is a multifaceted issue intertwined with operational processes and patient-centered care, offering actionable insights for improving public hospital services in the region.

**KEYWORDS**: healthcare quality, exploratory factor analysis, patient experience, Philippines, public hospitals, SOCCSKSARGEN region

#### I. INTRODUCTION

A major issue tackled in this study is the non-fulfillment of the standards and provision of services of public hospitals in the SOCCSKSARGEN region, which has a bearing on patient satisfaction and general health outcomes. The health system is complex and always changing, and the abilities that require health administrators and leaders to solve new incoming concerns are not much understood by the administrators and leaders [1]. In low-and middle-income countries, while there is still improvement in health outcomes, changing needs for health care, rising public expectations, and lofty policy objectives threaten to dislodge even the best-health care delivery systems [2]. Additionally, the persistent gap in providing high-quality treatments that meet patient expectations highlights the need to address these issues with utmost urgency. (Marques et al., 2023)

The degree to which healthcare services, whether for people or entire communities, increase the likelihood of achieving desired health outcomes by drawing on evidence-based expertise is referred to as quality of care, and it is critical in the effort to achieve universal health coverage [3]. While the IOM's definition appears to be more narrowly focused on 'health outcomes' than Donabedian's 'patient welfare,' the IOM went on to explain that these 'desired' health outcomes include not only broad health status or quality-of-life measures, but also factors such as patient satisfaction and well-being [4]. Over the last 40 years, different definitions, conceptual frameworks, improvement methodologies, and indicators have been established to meet the needs of providers and policymakers in setting and achieving quality goals in healthcare [5]. Public reporting of health care quality began as an effort to not only reward health care systems to improve performance on quality indicators, but also to provide transparency for patients and empower them as health care consumers [6].

In developing nations, public hospitals serve as the principal healthcare delivery channels, and is critical to ascertain the extent to which these institutions fulfill the growing demand for efficient healthcare services [7]. While there have been some developments in the Philippine healthcare system [8], it continues to grapple with various challenges such as the increasing prevalence of non-communicable diseases, fragmented healthcare financing and service delivery, elevated healthcare expenses, disparities in resource allocation, and

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restricted patient involvement. Furthermore, there are overarching concerns related to healthcare equity, data limitations, ethical conflicts, and even problems within the Philippine Health Insurance Corporation (PhilHealth) itself [9].

Traditionally, healthcare quality assessment leaned heavily on objective metrics such as mortality and morbidity rates [10]. However, the evolving healthcare landscape has elevated the importance of considering patient perspectives in gauging quality. In today's fiercely competitive healthcare environment, providers prioritize understanding and meeting the expectations of their clients over imposing their own assumptions to remain competitive [11]. As noted by Hines et al. (2020) [12], the longstanding commitment to improving patient care quality has been a fundamental aspect of healthcare which was evident in historical instances, such as Walter Letterman's Civil War triage and Florence Nightingale's infection control measures, representing early advancements in care.

Ancient healthcare quality concepts, rooted in enduring principles, shaped modern healthcare significantly [13]. For example, Hippocrates' Hippocratic Oath valued patient welfare, confidentiality, and nonmaleficence, establishing the groundwork for patient-centered care [14]. Early healthcare practitioners valued compassion and decency in patient treatment [15]. Furthermore, Florence Nightingale introduced infection control principles, recognizing cleanliness's role in preventing disease spread. Healing environments, addressing psychological and emotional aspects, were integral [16]. Moreover, early practices, based on empirical observations and natural remedies, paved the way for evidence-based care [17]. Likewise, emphasis on prevention, including quarantine and lifestyle recommendations, echoes in contemporary healthcare quality principles [18]. These historical insights continue to influence patient-centeredness, safety, evidence-based care, and preventive measures in modern healthcare.

As per the World Health Organization (2020) [3], quality healthcare services should encompass several fundamental components. These comprise effectiveness, which entails delivering evidence-based healthcare to those requiring it; safety to avert harm; patient-centeredness, which tailors care to individual preferences and needs while structuring services around people's demands; timeliness to mitigate waiting times; equity to guarantee uniform quality of care regardless of diverse factors; integration for well-coordinated care across providers and levels; and efficiency to optimize available resources and minimize wastage.

The growing concern surrounding medical errors attributed to nurses and the complexity of assessing their competence in healthcare service delivery have prompted an investigation into the influential factors affecting their competency, as evidenced in a study conducted by Feliciano et al. (2019) [19]. This descriptive cross-sectional study, which aimed to assess nurses' competence in selected hospitals in Central Luzon, Philippines, has revealed that various demographic factors, including marital status, and work-related factors such as job nature, salary, and length of service, exert an impact on their competence levels. Furthermore, the research has underscored that nurse tend to exhibit higher levels of competence in their workplace when they possess permanent employment status.

In 2016, the NHS in England underwent a comprehensive independent evaluation aimed at improving healthcare standards. This evaluation revealed numerous national initiatives aimed at elevating healthcare quality, primarily driven by concerns over patient safety and suboptimal hospital care. These initiatives leaned heavily towards regulatory governance and performance metrics, as evidenced by the appointment of national chief inspectors to supervise care and the introduction of a public rating system encompassing primary, social, and hospital care. Rather than emphasizing the development of healthcare professionals' quality improvement skills, these initiatives placed a greater emphasis on regulatory control measures [20].

Kourkouta et al. (2021) [21] conducted reviews examining the relationship between healthcare service quality and overall health. These reviews highlighted that certain dimension of health service quality, such as consistency, completeness, and effectiveness, pose challenges in measurement, often relying on subjective evaluations by clients. However, even clients' subjective assessments can vary and may differ from evaluations by healthcare professionals who assess service design and delivery. While researchers debate whether patients' perceptions accurately reflect the "true" quality of a service, patients will inevitably form their own judgments about service quality. In healthcare management, patient views are frequently referred to as perceived quality, as opposed to the objective or absolute quality required for effective management.

Healthcare quality is a poorly defined and understudied topic in low- and middle-income countries (LMICs). There is no commonly agreed concept of high-quality care, and no set measures to measure it [2]. In one study, an evaluation of hospitals was carried out, with a focus on their management practices and the readiness of their service capacity, both of which are structural aspects of healthcare quality that were investigated [22]. A validated self-administered online questionnaire was used to collect data on hospital management and service delivery from a sample of both public and private hospitals. By using Donabedian's framework as a guide, this study concentrated on the governance, administration, service capacity, and readiness of healthcare quality. The findings revealed inconsistencies in hospital management, particularly between privately owned and locally owned hospitals, exposing shortcomings in several areas. These included issues

with systematic target management, the lack of standardized care protocols, and the sparse use of quality and efficiency metrics. Service readiness issues included unstable access to water and electricity, a lack of basic diagnostic tools, irregular staffing patterns, and drug shortages. To improve the effectiveness of healthcare reforms, improve health outcomes, and maximize cost-efficiency, the study emphasizes the significance of robust health information systems, aligning healthcare quality with financing mechanisms, encouraging providers to collect and evaluate high-quality data.

In 2018, Suhlrie and their team conducted an extensive study on the vital role of energy in healthcare facilities, involving rigorous literature review and collaborative discussions. This effort led to the creation of a comprehensive conceptual framework aimed at evaluating how electricity supply quality impacts energy utilization in healthcare institutions and how effective lighting affects nighttime care services in Malawi. The study's findings revealed positive outcomes as envisioned in the framework, including improved patient outcomes, increased operational efficiency, and enhanced working conditions for staff, ultimately contributing to better population health. Additionally, the preliminary data analysis indicated that facilities with lower-quality electricity supply tended to have less efficient energy consumption. Interestingly, institutions providing critical services, like child delivery and overnight care, faced a significant shortage of functional lighting, although the presence or absence of lighting did not seem to affect nighttime care availability.

The study is underpinned by a conceptualization of healthcare quality through the Donabedian model, defined by three prime components—structure, process, and outcome—framed to identify indicators that augment or inhibit the incorporation of eHealth into healthcare organizations based on organizational and social contingencies [23]. The Patient Centered Care Model focuses on providing care that is respectful of and attentive to individual patient choices, needs, and values, which is one of the six core aspects of healthcare quality outlined by the Institute of Medicine (Dan, 2021). The SDL Model explains health care as the co-creation of services between providers and patients, thus highlighting the importance of patient participation in service delivery (Vargo & Lusch, 2004). These theories, taken together, form a good framework for understanding the multi-layered nature of healthcare quality in public hospitals.

A systematic evaluation of healthcare quality reveals that multiple interrelated factors shape patient experience and satisfaction. One is financial, that is, like payment modalities, availability of financial aid, and emotional support, which primarily shape the patient's perspective. The others include operational factors such as waiting time and hospital cleanliness, which impact the efficiency and effectiveness of service delivery. Infrastructural components, such as comfort, accessibility, staffing, training, space, and equipment, play a significant part in providing a supportive, conducive, and functional healthcare environment. These would be examined as a whole through exploratory factor analysis to produce a comprehensive understanding and make it possible to show improvement in the quality of healthcare services.

There exists a fundamental research gap regarding the lack of extensive studies focused on healthcare service quality in its strictly specified SOCCSKSARGEN context. While national and international literature has offered extensive insight into healthcare quality, there is a void with respect to the regional cultural populations (i.e. indigenous people, urbanization as seen in General Santos City, and geographically distant rural populations). This is a significantly neglected area as time delays and low service satisfaction is higher in rural and remote areas compared to urban settings [24]. Indigenous population within SOCCSKSARGEN areas experience higher maternal and childhood mortality rates, malnutrition, low access to primary healthcare services etc. [25]. Moreover, Mindanao provinces have lower health insurance coverage and health access, which contributes to health equality concerns [26]. Given these contexts, it is imperative that area specified research is conducted for proper and effective planning and interventions for improvement in the healthcare system and services offered in the SOCCSKSARGEN area is culturally sensitive while still being as resource efficient as feasible.

The general objective of the study is to characterize the quality of healthcare in Philippine public hospitals using exploratory factor analysis (EFA). Specifically, the study aims to: determine the underlying factors that characterize the quality healthcare in selected public hospitals of SOCCSKSARGEN region through EFA; to determine factor loading/structure of latent variable; to develop scale on quality healthcare in Philippine Public Hospitals.

Fig. 1 provides a visual representation of the conceptual framework for the study, illustrating the key dimensions within the latent variable labeled "Quality Healthcare Services." This diagram highlights the interconnected elements that define the quality of healthcare services. By outlining these dimensions, the figure offers a comprehensive overview of the various aspects that characterize healthcare service quality.

Furthermore, it depicts the underlying aspects of quality healthcare services, identified as F1, F2, F3, and Fn. These dimensions are provisional and will be further analyzed using the data collected. The analysis will identify the factors or dimensions expressed by the respondents and name them based on thematic similarities.

The work is globally significant for its contribution to literature regarding healthcare and the improvement of the welfare of the local SOCCSKARGEN community. The study helps facilitate the cleaving of the theoretical frameworks from practical realities by identifying determinants of quality of care in the public hospital setting through exploratory factor analysis. The findings discussed here are invaluable to healthcare institutions, practitioners, policymakers, and the communities at large, thus forming a methodological context for similar studies geared at improving service quality in different settings in the future. The work thus furthers the Sustainable Development Goal 3- Good Health and Well-being practice, as it identifies multifaceted challenges in healthcare delivery, informs evidence-based policymaking, and translates into better health outcomes, thus enhancing its relevance to academia and society [27].

# **II.HEADINGS**

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# **III.INDENTATIONS AND EQUATIONS**

#### **3.1. Research Respondent**

This study proposes to include patients who have received some form of healthcare in the public hospitals across the SOCCKSARGEN regions as the target population. For the quantitative phase, a sample size of 250 patients was chosen from the strata under a random sampling method to allow representation from urban, rural, and indigenous communities as well as their varying experiences with health care [28][29]. Furthermore, the qualitative data were taken from 30 key informants comprising health-care providers and administrators, who imparted deeper contextual insights into factors affecting quality in health-care services. The stratification approach ensures that varying socio-economic and cultural perspectives are captured for the region.

The inclusion criteria for survey participants included: being above the age of 18, receiving services in a public hospital in the SOCCSKSARGEN region in the last 12 months, and giving informed consent. Potential subjects excluded from this study failed to satisfy one or more of these criteria: not having sought service within the last 12 months or being unable to communicate intelligibly in the language of the research survey. Key informants were selected for qualitative purposes based on their different professions involved in hospital administration and healthcare service delivery and had to have a minimum of 2 years of relevant experience to elicit informed perspectives. Respondents were also made aware of their rights to voluntary withdrawal from the study at any time without adverse consequences.

These methodological choices and criteria are set to ensure the collection of robust and representative data truly portraying the multifaceted nature of health service quality accreditation in public hospitals within the SOCCSKSARGEN region.

# 3.2. Materials and Instruments

A combination of qualitative and quantitative techniques was utilized in this study. In addition to the qualitative interviews, there was an instrument made by the researcher for the satisfaction survey based on a literature review, that was administered to residents, hospital staff, administrators, nurses, and physicians of the identified public hospitals in the SOCCSKSARGEN area. These sources provided another set of responses that assisted in creating the survey questionnaire and then on content and expert validation. In the CRPG a structured questionnaire based on the DoH Hospital Resources Guidelines for the general component of health was created to measure Hospital Resources with the breakdown of criteria areas of Facility Infrastructure, Staffing Level, and Medical Equipment, with participants responding to Hospital Resources questions using a Likert scale of 1 (poor) to 5 (excellent). For Healthcare Processes, structured observations and reviews were conducted on various process issues utilizing a binary (yes/no) measure to record responses. Along with Patient-Centered Care, a survey was utilized to measure the participants' shared decision-making and communication skills, and patient empowerment with one set of questions, also using a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). The survey questionnaire was validated via internal and external validators, with the validation process reporting a 96% accuracy rate. The approach used in this study is consistent with the cross-cultural validation of patient experience measurement tools in the Philippines, and it provided similar enhancement to

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the HCAHPS survey into Filipino language, and it was reported that the validation processes reported strong content validity and internal consistency of the measure [30].

#### **3.3. Design and Procedure**

A cross-sectional study design was employed to represent the status of healthcare service quality in public hospitals of the SOCCSKSARGEN region [31]. Data were collected using structured instruments: a questionnaire for assessing hospital resources and patient-centered care, and structured observations for evaluating healthcare processes. The questionnaire was developed through a literature review and interviews with residents, hospital employees, administrators, nurses, and doctors using a 5-level Likert scale to gauge dimensions such as facility infrastructure, staffing levels, medical equipment, shared decision making, communication, and patient empowerment. Process-related criteria were measured through Yes/No. Exploratory Factor Analysis (EFA) was used as the main statistical analysis to deduce latent factors related to service quality and descriptive and inferential statistics much correlated with the study outcomes in terms of their correlations, regressions, and ANOVA gave added insights. Participants were also systematically recruited using a well-planned stratified random sampling to maximize representation, and comprehensive information about the study was provided to them. All the recruited study participants gave their informed consent before data collection, having comprehended the objectives and procedures of the study [32].

All ethical considerations were stringently maintained during this study. The research protocol was approved by the University's Research Ethics Committee under UMERC Protocol No. 2024-150, and all participants provided written informed consent before taking part in the study. Confidentiality and anonymity were ensured, and the participants had the right to withdraw at any time without penalty. These protocols guaranteed that the study was conducted in compliance with ethical standards in order to safeguard the rights and welfare of all participants.

# **IV. RESULTS AND DISCUSSIONS**

This section presents and interprets the study's findings. Exploratory Factor Analysis (EFA) was employed to analyze the data collected from the survey questionnaire. The results are presented in a systematic manner, including: measures of sampling adequacy and sphericity, rotated component matrix, extracted factors characterizing the quality healthcare services in the SOCCSKSARGEN Region, latent roots criterion for the extracted variables, as well as the theme framework constructed based on the study's findings. In addition, a discussion is provided to help clarify and understand the findings.

Table 1 shows the results of the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity, which help determine whether the data is suitable for factor analysis. The KMO statistic is used to assess whether the sample size is appropriate for factor analysis [33]. The KMO Measure of Sampling Adequacy, at 0.933, entails very appropriateness of the data for factor analysis; a value above 0.9 generally hints those tight correlations among variables cause factor analysis results to be deemed credible, thereby confirming the elusiveness of underlying factors in healthcare quality. This concurs with Yusof et al. (2020), who applied exploratory factor analysis to establish linkages among variables affecting the quality of life and have corroborated the effectiveness of the method in exploration with reduced variables [34].

Additionally, Bartlett's Test of Sphericity is used to check whether factor analysis is a suitable method for analyzing the data. In this study, the calculated chi-square value was approximately 6911.762 with 1,225 degrees of freedom, and the test was statistically significant (p < 0.01). Regarding Objective 1, the high KMO value, combined with the significant result of Bartlett's Test, confirms the adequacy of the data for identifying factors underlying healthcare quality in public hospitals. Importantly, the significance level of 0.000 suggests that the data is well-suited for exploratory factor analysis.

The latent roots criterion of the extracted factors is illustrated Table 2 revealed the variance of various components in measuring quality health care in selected public hospitals of the SOCCSKSARGEN region. As for variance, the first component has the highest figure with 17. 929, or 35.858 % of variance. This means that this component holds the dimension that will account for the vast majority of the subjects' differences; thus, it may measure a fundamental element defining quality healthcare

The total variance of the second component equals 2.472, or 4.945% of variance. The trend is carried forward across other components; the third component accounts for 4.335% of variance.

The eleventh component has the lowest percentage contribution to the total variance with a value of only 1.019 or 2.039%. Thus, the overall pattern identified in the table shows a reduction in the percentage of variance explained as the number of components increases. This means that the major amount of total variation is explained by the few components, which are understood to be key risk factors or drivers of quality in healthcare. Holding great importance to the first components, the remainings still affect the overall, while their individual implications on variance are ever-diminishing.

The first component alone accounts for 35.858% of the total variance and is, therefore, the major determinant of healthcare quality. The second and third components explain 4.945% and 4.335%, respectively. Thus, these three explain 45.138% of the total variance. Such considerable accumulated contribution indicates the presence of a very few dimensions that bear brunt upon healthcare service quality.

It is conceivable that real improvement can be achieved by focusing on the dominant domains constituting patient-centered care, infrastructure, or staff. While the other lower components comprise accounts, their relative influence is weak, suggesting resource allocation and policy should give priority to the more impactful areas.

The findings affirm earlier studies in this regard. Mosadeghrad (2019) [35] argued that quality in healthcare relies upon certain core factors. The study substantiates the inference that a few principal elements are the considerable drivers in healthcare quality service narrative reflected in the healthcare environment of the SOCCSKSARGEN region.

45.138% of the total variance is interpreted through the first three components indicating them as the main latent variables determining healthcare quality. The separate function of the first component explains 35.858%, showing its importance in the factor structure. These important latent variables represent the most vital sectors for health improvement. By understanding these factors, public hospitals can make better decisions about resource use and hence increase patient outcomes by concentrating on the most important areas.

Piña et al. (2019) [36] stated that it's usually about patient care and management practices that are the most important factors. In addition, Mosadeghrad (2019) [35] pointed out the significance of focusing on the primary hidden variables in healthcare improvement. The initial three parts are responsible for 45.138% of the variation thus forming a basis for establishing a healthcare quality index. The remaining parts contribute lesser percentages bringing finer details to this index.

The main focus identified from the first three components has to take precedence in a healthcare quality index. These elements play vital roles in assessing as well as enhancing healthcare outcomes in public hospitals and other additional aspects can enhance the scale.

Work that was undertaken by Patra and Ray (2019) [37] has led to the inference that operating efficiency and key service delivery variables are important. Mosadeghrad (2019) [35], stressing the importance of core factors, stated that this is a fundamental approach to developing measurement tools in healthcare for assessing quality. Continuing this line of thinking, current studies have elaborated further on the need for a sound measurement framework in the area of healthcare and have particularly emphasized psychometric evaluation as a tool for measuring healthcare delivery. For instance, research conducted by McClain et al. (2024) [38] validating the interdisciplinary healthcare team measures suggests that attitudes towards team-based care may capture the perceived quality of healthcare services rendered to select groups, such as pediatric autism patients, factoring into the overall efficiency of service delivery [38].

Again Josiah et al., (2024) [39], it is suggested that structured questionnaires based on such established models like the Donabedian framework for assessing healthcare quality and the SERVQUAL framework are significant. These results are closely in line with the conceptual framework put forward by Mosadeghrad [39]. This way, it stands to reason that the identified core factors are theoretically sound and practically relevant in addressing the current challenges that pertain to the healthcare system, thus calling for empirical validation of the quality measurement tools. This in all emphasizes a pressing need for validating the tools used for measurement, and this instills confidence in assessing the influential variables concerning healthcare quality.

The scree plot displays the eigenvalues for each factor in relation to their component numbers. Introduced by Cattell (1966), this visual tool helps identify how many factors should be kept during exploratory factor analysis. The steep decrease from the first to the second component indicates that the first component carries the most weight, capturing the greatest amount of variance within the dataset. After the second component, the slope tends to become horizontal, which means that additional components are of minimal importance in terms of explaining variance.

From inspecting the graph, it can be observed that only the first few components (about 2 or 3) have eigenvalues over 1, since they lie before the curve starts to flatten. This further justifies using these components for more analysis because they account for a greater portion of the variance. RO1

Table 3 displays factor loadings that show how an item correlates to each of the extracted components, which serves as a guide in determining the contribution of each variable in explaining the underlying dimensions of quality healthcare services in chosen public hospitals.

Q46 (0.640), Q44 (0.634), and Q39 (0.632), among other items, have high loadings on this component. The high loading values imply that these items contribute a lot towards explaining the first component; hence, it suggests that there is a significant underlying factor probably regarding one of the main qualities' dimensions of SOCCSKSARGEN hospitals' health care services.

The second component has a significant number of items that load heavily on it, including Q31 (0.735) and Q30 (0.712). The factor may serve as an additional dimension of healthcare quality that could possibly be associated with administrative or operational efficiency, based on their moderate correlations with it. RO2

The third component includes Q14 (0.826) and Q13 (0.717), which are strongly loaded items in this respect. They might serve as determinants of one other distinct factor associated with patient care or interaction dimensions.

Other components: components 4 to 11 show generally lower loadings on all the items and that means they account for lesser variances in comparison to the first three components. For instance, component 11 is primarily represented by Q18 (0.818), indicating a probable particular but less significant aspect.

As per the factor loadings, the bulk of the variance in data is due to the first few components meaning that a smaller number of factors could explain most general attributes for quality healthcare services. The high loadings in Component 1 highlight certain quality dimensions, while those that are moderately loaded in later components show other aspects that support overall healthcare quality yet have lesser impact. RO3

The findings here provide a basis for devising an all-inclusive scale for assessing healthcare quality; this can specifically be done by concentrating on principal variables as shown by the first three principal components which had greatest loadings.

Because of strong factor loadings, the analysis reveals that there are various dimensions like had been hypothesized which shows that quality of healthcare is multi-faceted in nature.

Table 4 (Factor 1): This factor has strong links to financial elements of care, interaction as well as emotional support. The high loadings shown by various items such as financial assistance programs (Q46), billing information clarity (Q44) and coordination of care (Q40) emphasize the importance of affordability, transparency and communication in health care services.

Table 5 (Factor 2): Patient experience is emphasized by Factor 2 with high loadings on certain items; waiting times (Q31) and cleanliness (Q30) are two examples. These aspects reflect how operationally efficient or comfortable is a hospital's environment therefore suggesting that they significantly affect patient satisfaction levels.

Table 6 (Factor 3): This issue has to do both with the area where health centers are located and how easy it is to reach them since it has high loadings for waiting room comfort (Q14) and neatness (Q13). These discoveries affirm that hospital infrastructure and how accessible health services are contribute significantly to patients' welfare.

Table 7 (Factor 4): deals with empathy (Q5) showing high correlation coefficients together with communication skill factors (Q4). Hence, this aspect reflects on providing high-quality relationship-based care in hospitals as well as good teamwork among caregivers.

Table 8 (Factor 5): Communication during emergencies (Q50), as well as parking availability (Q27), represent important elements of this factor, which highlights logistical aspects that contribute towards patient convenience and satisfaction during emergencies.

Table 9 (Factor 6): Factor 6 encompasses clinical competence as shown through high loadings of ability to diagnose (Q2) and services being delivered on time (Q7). This implies that technical skills and promptness are crucial determinants in patient care.

Table 10 (Factor 7): This aspect emphasizes logistical comforts including acceptable waiting durations (Q22) and the location of healthcare centers (Q23). Such results show that the location and booking process are key elements for individuals seeking treatment in public hospitals. RO1

Using Exploratory Factor Analysis (EFA), various factors were established to influence the quality of health care in public hospitals in SOCCSKSARGEN: financial assistance, billing clarity, and emotional support formed Factor 1. Waiting times and hospital cleanliness were included in Factor 2. Factor 3 consisted of comfort, medical equipment, and accessibility as its components; while factor 4 emphasized cultural sensitivity and communication. At last, parking and emergency communication formed part of factor 5. They encompass the different things that matter most to patients about their health services.

While the involved aspects indicate that healthcare delivery has multiple dimensions ranging from its funding to treatment environments, this should encompass better quality in all domains. Hospital administrators striving toward patient satisfaction need to focus on these elements. Financial clarity, shorter waiting times, and improved relationships create positive patient impressions of quality healthcare. Enhancement of these systems will build confidence and improve the general quality of treatment in government establishments.

Here are some similarities between the results of this study and previous studies done by Vasylieva et al. (2023) [40] on emotional and financial support in healthcare settings. Watterson et al. (2021) [41] conducted similar research that found operational efficiency as an important determinant of patient satisfaction including

reduction of waiting time. The findings confirm that patient-centered care involves both functional and emotional dimensions which is consistent with the current literature. RO2

The factor loadings, which were obtained from EFA, indicate how strongly each of the observed items is associated with its factor in question. The item that had the highest loading (0.64) in Factor 1 was Q46 (financial assistance), pointing out that the patient takes into consideration financial factors a great deal. In factor 2, waiting times represented by Q31 had the highest loading (0.735), an indication that operational efficiency is very important. From these loadings insights about what elements are most influential to each factor can be determined.

Patients typically focus on distinct attributes like money support and low waiting time when they rank their health care experience as shown by high factor loadings. By knowing these relationships, health care providers are able to address the aspects that contribute to patient satisfaction. For example, by improving billing communication or shortening waiting times, it is possible to boost perceptions of care quality quite significantly.

The outcomes align with conclusions reached by Bernardo et al. (2022) [42], who pointed out that financial openness and operational efficiency are important for customer gratification. Likewise, Anabila et al. (2019) [43] stressed on the need for shortening waiting periods and making sure that public hospitals are affordable. This research helps to reiterate the significance of handling logistical as well as monetary issues in order to satisfy patients' demands in state-run health care facilities.

Regarding Objective 3, this finding provided a sound basis for developing a scale on healthcare quality. Since these factors are reliable, we are sure that they can be used in practice. RO3

In the factor analysis, the developed scale classifies healthcare quality into financial, emotional, and operational dimensions. Each factor represents a certain aspect of the patient experience that can be used to measure healthcare quality in public hospitals. Thus, it is a holistic instrument for evaluating healthcare quality in public hospitals. It is a standardized model that will enable hospitals to evaluate different patient issues including service delivery and make necessary improvements.

This scale serves as an operational device for evaluating and enhancing patient care by public hospitals. Since these are the dimensions that have been identified, hospitals can pay attention to them to improve their patients' experiences and build trust with them. Administering such a scheme enables management to focus on the priority areas that need changing to achieve better health services.

This scale was developed in line with Ampaw et al. (2020) [44], who emphasized the need for comprehensive assessment tools that encompass various facets of healthcare quality. Kaitelidou et al. (2019) [45] equally accentuated the significance of formally structured measurements in superficial features of healthcare service provision. Based on these, this research contributes to existing literature by providing a validated tool that can be used to evaluate the quality of health care provided in public hospitals in the Philippines.

The factors identified based on the results—financial assistance and billing, support and communication, efficiency, patient orientation, access, staff competence, and facilities and resources all affect the quality of health services in SOCCSKSARGEN. All these factors are major determinants of the experiences that patients have with health facilities, and hence the quality of health care in the region.

Firstly, in financial aspects, financial aid and billing determine the price sensitivity and comprehensiveness of the perception regarding healthcare services. Easy-to-understand invoices, and readily available financial assistance aid in reducing financial burden acting as population enablers for healthcare.

Patients' concerns and anxiety have to be resolved through dedicated communication, and therefore the study underlines the need for emotional support. The communication between the healthcare providers and patients builds trust, and patients make sure that they understand the plan that is taken.

All measures related to the operational efficiency, such as waiting time or the organization of care processes, are linked to patient satisfaction. Smooth and efficient work helps eliminate the patient's anger and discontent and brings additional value to the process of providing medical care.

Patient-centered care emphasizes respecting each patient's autonomy, as well as valuing their preferences, opinions, and beliefs in the decision-making process. Patient participation in preventing clinical decisions enhances the quality of care by being oriented to a patient's preferences.

Finally, general and patient accommodation, the competence of medical staff, and infrastructure and resources guarantee that patients get a positive environment. Adequate provision of ambiance, quality, and qualified personnel alongside appropriate equipment imply high-quality health care by satisfying the body and soul. Taken together, all these contribute to a comprehensive quality of healthcare where all the complex and interrelated aspects of patients in SOCCSKSARGEN should be attended to.



Fig. 1. Conceptual Framework of the Study







Fig. 3. Developed Framework for Factors Affecting Quality of Healthcare in Public Hospitals within SOCCSKSARGEN

Kaiser-Meyer-Olkin Measure of	Sampling		
Adequacy.			0.933
Bartlett's Test of Sphericity		Approx. Chi-Square <mark>df</mark>	6911.762 1225
		Sia.	0.0000

# Table 1. Measure of Sampling Adequacy and Sphericity

# Table 2. Latent Roots Criterion of the Extracted Factors

Factors	Total	% of Variance	Cumulative %
1	17.929	35.858	35.858
2	2.472	4.945	40.803
3	2.167	4.335	45.138
4	1.532	3.063	48.201
5	1.411	2.821	51.022
6	1.322	2.644	53.666
7	1.236	2.472	56.138
8	1.16	2.32	58.458
9	1.094	2.187	60.645
10	1.036	2.072	62.718
11	1.019	2.039	64.756
9 10 11	1.094 1.036 1.019	2.187 2.072 2.039	60.645 62.718 64.756

# Table 3. Factor Loading of Quality Healthcare Services

#### Component

Item Statements	1	2	3	4	5	6	7	8	9	10	11
Q46	0.64										
Q44	0.634										
Q39	0.632										
Q38	0.618										
Q40	0.601										
Q48	0.598										
Q47	0.584										
Q43	0.543										
Q45	0.514										
Q31		0.735									
Q30		0.712									
Q32	_	0.552									
Q37		0.542									
Q42	_	0.542									
Q29		0.528									
Q36		0.515									ļ]
Q35		0.491									<b>↓</b> ]
Q34	_	0.486									
Q33	_	0.45									
Q41		0.441									I
Q14	_		0.826								
Q13			0.717								II
Q20			0.622								
Q15			0.578								
Q21	_		0.469								<u> </u>
Q19			0.455								
Q26	_		0.418								<u> </u>
Q25			0.401								<u> </u>
Q27	_			0.675							
Q50				0.67							<u> </u>
Q49	_			0.597							<u> </u>
Q28	_			0.494							
02	_				0.704						<u> </u>
Q7					0.617						<u> </u>
Q6					0.528						
<u>Q1</u>					0.458	0.007					II
09	-					0.667					<u> </u>
						0.633					┟────┤
05						0.445					┟────┤
01						0.417	0.672				<u>                                     </u>
010							0.673				┟────┤
016							0.539				<u>                                     </u>
022							0.45	0.62			
022								0.62			<u>                                     </u>
024								0.527			┟────┤
024								0.4/8	0.660		<u>                                     </u>
017									0.666	0.625	├───┤
02										0.625	
019										-0.53	0.910
210											0.818

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 21 iterations.

Item Number	Item Statements	Coefficients				
Factor 1: Financial Assistance and Billing						
Q46	Financial assistance programs offered by the hospital.	0.64				
	Clarity of billing information provided by the hospital (including fees,					
Q44	charges, and payment options).	0.634				
	The healthcare providers provide emotional support and address my					
Q39	concerns and anxieties related to my health very well.	0.632				
	The information provided to patients about treatment plan, including					
Q38	potential risks and benefits.	0.618				
	Coordination of care among different healthcare providers involved in the					
Q40	treatment.	0.601				
	The hospital staff's ability to explain medical information and treatment					
Q48	plans in a way that is easy to understand.	0.598				
	The overall communication skills of the hospital staff, including doctors,					
Q47	nurses, and administrative personnel is excellent.	0.584				
Q43	The healthcare services provided by public hospital is affordable.	0.543				
	Hospital's acceptance of insurance coverage and the overall billing					
Q45	process.	0.514				

# Table 4. - Factor 1: Financial Assistance and Billing

 Table 5. - Factor 2: Emotional Support and Communication

Item Number	Item Statements	Coefficients
Factor 2: Emot	ional Support and Communication	
	Waiting times at the hospital, including waiting to see a healthcare	
Q31	provider and waiting for test results.	0.735
Q30	Overall comfort and cleanliness of the hospital facilities.	0.712
Q32	Public hospitals prioritize the well-being and comfort of patients.	0.552
	The healthcare providers very well respect my preferences, values, and	
Q37	cultural beliefs when planning my healthcare.	0.542
	The healthcare providers often encourage shared decision-making in	
Q42	healthcare experience?	0.542
	The hospital accommodates patients who speak languages other than the	
Q29	primary language of the region very well.	0.528
	Patient involvement in the decision-making process regarding healthcare	
Q36	and treatment.	0.515
	Communication between patient and the healthcare providers regarding	
Q35	health condition and treatment options.	0.491
	Patient preferences and concerns are taken into consideration in the	
Q34	treatment process.	0.486
Q33	The hospital staff treats patients with respect and empathy.	0.45
	Access information to health records, test results, and other relevant	
Q41	information.	0.441

Table 6	Factor	3: Of	perational	Efficiency
tom Numh	019	Itom	Statoma	ata

Item Number	Item Statements	Coefficients
Factor 3: Opera	tional Efficiency	
Q14	The waiting areas and facilities are comfortable for patients.	0.826
Q13	The hospital maintains a clean and hygienic environment.	0.717
	The comfort of the waiting areas in the hospital (seating, cleanliness, etc.) is	
Q20	excellent.	0.622
Q15	Availability of essential medical equipment in the facility.	0.578
Q21	Integration of information technology in the healthcare services I received.	0.469
	The hospital facilities are accessible for patients with disabilities, including	
Q19	ramps and elevators.	0.455
	Easily access to information about hospital services, healthcare providers,	
Q26	and other relevant details.	0.418
	The waiting time at the hospital, from check-in to seeing a healthcare	
Q25	provider is very short.	0.401

Item Number	Item Statements	Coefficients				
Factor 4: Patient-Centered Care						
	The medical staff understands and addresses the cultural needs of					
Q9	diverse patient populations.	0.667				
	The medical staff effectively handles and addresses patient complaints					
Q11	or concerns.	0.633				
	The hospital is well-equipped with the necessary medical facilities and					
Q12	equipment.	0.445				
Q5	Medical staff exhibit empathy and provide patient-centered care.	0.417				
	The communication skills of medical staff in explaining medical					
Q4	information to patients is excellent.	0.673				
	The collaboration of medical staff with other departments in the hospital					
Q10	to enhance patient care is excellent.	0.539				
Q16	Cleanliness and ambiance of the hospital facilities where I receive care.	0.45				

Table 7	Factor 4: Patient-Centered	Care

Table 8	Factor 5	: Accessibility	and	Comfort

#### Item Number **Item Statements**

Factor 5: Acces	sibility and Comfort	
	The medical staff understands and addresses the cultural needs of diverse	
Q9	patient populations.	0.667
	The medical staff effectively handles and addresses patient complaints or	
Q11	concerns.	0.633
	The hospital is well-equipped with the necessary medical facilities and	
Q12	equipment.	0.445
Q5	Medical staff exhibit empathy and provide patient-centered care.	0.417
	The communication skills of medical staff in explaining medical	
Q4	information to patients is excellent.	0.673
	The collaboration of medical staff with other departments in the hospital	
Q10	to enhance patient care is excellent.	0.539
Q16	Cleanliness and ambiance of the hospital facilities where I receive care.	0.45

 Table 9. - Factor 6: Medical staff Competence

Item Number **Item Statements** 

Factor 6: Medical Staff Competence					
Q2	Medical staff's ability to diagnose and treat medical conditions	0.704			
Q7	The clinical competence of the medical staff. Satisfied with the timeliness of medical staff in providing services t	0.617 to			
Q6	patients.	0.528			
Q1	The medical staff at public hospitals are knowledgeable and skilled.	0.458			

# Table 10. - Factor 7: Medical staff Competence

Item Number	Item Statements	Coefficients
Factor 7: Medical Staff Competence		
Q22	Waiting times for medical services are reasonable. The hospital's location is convenient in terms of distance and transportation	0.62
Q23	options.	0.527
Q24	Ease of scheduling appointments with healthcare providers in the hospital.	0.478

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Coefficients

Coefficients

The research has met its objectives, one of which is to reveal and explain the main underlying causes of healthcare quality in the public hospitals of SOCCSKSARGEN and, subsequently, to develop a preliminary measurement scale on healthcare quality through exploratory factor analysis (EFA). According to the first objective, scree plot and EFA revealed three dominant factors: financial and sentimental aspects (35.858% variance), operational variables such waiting time and cleanliness (49.95% variance), and infrastructural elements including comfort and accessibility (34.35% variance, cumulatively contributing 45.138% to the overall variance). These three factors are the key determinants in patient experience. Therefore, this study suggested that public hospitals should prioritize improving the mechanisms or systems of financial assistance and billing transparency while also engaging in specific strategies to improve waiting time and internal cleanliness at the facilities. The declinations in factor loadings exhibited by many variables in this second objective indicate that too few items adequately denote the underlying constructs of healthcare quality. Moreover, the administrators should ensure that such limited components are reinforced with sufficient resources and staff development through proper training. For the last objective, an indicator of the quality of healthcare would be a scale on which to spot these major components in the continuous assessment system; therefore, the current scale should be integrated as a monitoring tool into its use in enhancement efforts for continuous quality improvement.

The validated factors from this study emphasize the intertwined nature of service efficiency and patient experience. As such, the derived measurement scale provides a theoretically sound and empirically supported tool for assessing and guiding healthcare quality improvements in public institutions. The findings align with global and national healthcare literature, reinforcing the applicability of structured frameworks like SERVQUAL and the Donabedian model in the local context.

In light of these findings, public hospitals in the region are encouraged to institutionalize the use of the developed measurement scale as a standard quality monitoring tool. This scale provides an evidence-based framework to evaluate and continuously improve healthcare delivery, enabling hospital administrators to systematically identify areas needing enhancement. Central to this improvement is the need to strengthen financial transparency and assistance programs by ensuring that billing processes are clearly communicated and that support mechanisms are accessible to economically disadvantaged patients. Alongside this, efforts must be directed at improving operational efficiency through the reduction of waiting times and enhanced cleanliness, which are critical determinants of patient satisfaction.

Equally important is the reinforcement of communication and emotional support systems. Hospital staff should receive ongoing training in empathy, interpersonal communication, and cultural competence to better engage with patients and address their concerns effectively. Furthermore, investments in hospital infrastructure—such as waiting area comfort, disability access, and facility cleanliness—should be prioritized to enhance patient comfort and accessibility. Developing medical staff competence through continuous professional development is also vital, particularly in clinical decision-making, diagnostic skills, and collaborative care.

Adopting a patient-centered care approach is essential, ensuring that healthcare practices consistently respect patient autonomy, involve patients in decision-making, and accommodate diverse cultural values. To sustain these improvements, the validated quality scale should be revisited periodically and refined through patient feedback and data-driven evaluations. Aligning local strategies with national healthcare quality frameworks and international standards will further strengthen the capacity of public hospitals in SOCCSKSARGEN to deliver responsive, equitable, and high-quality healthcare services.

However, this study is not without limitations. The data was collected only from public hospitals within the SOCCSKSARGEN region, limiting the generalizability of the findings to other geographic areas or private healthcare institutions. Furthermore, while the EFA successfully identified core components, the study relied primarily on patient perceptions via structured questionnaires, which may not fully capture the complexities of clinical performance or administrative challenges. Additionally, some factors with lower loadings may have been underrepresented, suggesting that future studies should consider broader variable sets or mixed-method approaches to enrich understanding. Despite these limitations, the study provides a robust, empirically grounded framework that can serve as a basis for ongoing quality assessment and improvement initiatives in the region's public health system. Collectively, these integrated strategies lay the groundwork for meaningful enhancements in patient outcomes and public trust in government healthcare institutions. Collectively, these integrated strategies lay the groundwork for meaningful enhancements in patient outcomes and public trust in government healthcare institutions.

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