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Patient Perceived Quality Of Care And TheAssociated Factors For Selected InvasiveDiagnostic Procedures In Outpatient Departments

Ancymol M.C, M.Sc (N) [1],Punitha Ezhilarasu, Ph.D[2]
(Msc(N)Tutor, College Of Nursing, C.M.C Vellore, India)
(Sr Consultant, Former Dean College Of Nursing, Cmc Vellore, India)

Abstract
Background*: Continuous assessment is essential for delivering high-quality care, particularly in outpatient departments, which serve as the gateway to hospital services. It is crucial to evaluate the quality of care provided during diagnostic procedures in this setting. This study aims to assess patient-perceived quality of care and the associated factors for selected invasive diagnostic procedures in the outpatient department of CMC Vellore.*
Materials and Method: *A descriptive cross-sectional study was conducted to evaluate patient-perceived quality of care in the Medical, Surgical, and Orthopaedic Departments of Christian Medical College. Using Total Enumerative Sampling Technique, 140 subjects were enrolled and assessed through a Patient Perception Scale and a checklist developed by the investigator.*
Results: *More than half of the patients (55%) reported receiving high-quality care during their procedure, while 34.29% perceived moderate quality, and only 10.71% indicated low overall care quality. A statistically significant association was found between the type of procedure, doctor's gender, and the quality of care perceived by patients. Additionally, there was a negative correlation between perceived quality of care and waiting time (r = -0.211).*
Keywords: *patient perception, quality care, outpatient department, diagnostic procedures*

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I. Introduction

Quality is a perceptual, conditional, and somewhat subjective attribute often understood differently by different people. Measuring and monitoring health care quality is crucial. Despite advancement in medical sciences and technology, the health care system continues to face challenges in consistently delivering high-quality care to all (World Health Organization, 2006)[1]. The two principal dimensions of healthcare quality for individual patients are access to care and effectiveness of care provided. Achieving, measuring and improving quality in healthcare services is possible through the commitment and dedication of the health personnel. A comprehensive view of quality care highlights key dimensions[2]essential to the health care system, particularly patient's experiences and perceptions of care. Invasive procedures performed in the outpatient department of C.M.C, Vellore follow a series of orderly and well-defined steps, contributing to accurate diagnosis. This study aims to assess patient perceived quality of care and related factors for selected invasive diagnostic procedures in the outpatient departments of Christian Medical College, Vellore, South India.

II. Material And Method

This descriptive study was conducted in the outpatient departments of medical, orthopaedic and surgical units of Christian Medical College of Vellore, Tamil Nadu from 2-6-2015 to 12-7-2015. During the study period140 subjects (both male and female) >18yrs were selected to assess the quality-of-care perception.

Study Design: A descriptive cross-sectional design

Study Location: The study was conducted in medical, surgical and orthopaedic outpatient departments in Christian Medical College, Vellore, Tamilnadu.

Study Duration: 6 weeks, from 2-6-2015 to 12-7-2015

Sample size: 140 patients.

Sample size calculation: The sample size was calculated after the pilot study using the formula.

$$n = \frac{z_{1-\alpha/2}^2 \sigma^2}{d^2}$$

where, σ: Standard deviation
d: Precision
1-α/2: Desired Confidence level

The required sample size was determined using a standard deviation of 3, an absolute precision of 0.5, and a 95% confidence interval, resulting in a sample size of 138 subjects. To evaluate patients' perceived quality of care, consecutive (total enumerative) sampling was used, ensuring that all patients meeting the inclusion criteria were included in the study. During the study period, 140 subjects were selected to assess the quality of care.

b) Sample size of staff assessed for demographic variables and associated factors

All staff including doctors and nurses who were involved in the performance of selected procedures in the medical, surgical and orthopaedic outpatient departments.

Subjects & selection method

The study population included all patients who underwent selected invasive diagnostic procedure in surgical, medical and orthopaedic outpatient departments of C.M.C. Additionally, staff members including nurses and doctors working in theses department, were part of the study. A consecutive sampling or total enumerative sampling technique was used for the sample selection. Each day, the investigator visited medical, surgical and orthopaedic outpatient departments, identified the relevant procedures, observed the staff and selected patients who met the inclusion criteria. Data were collected using the patient perception scale.

Inclusion Criteria

1. Patients Undergoing lymph node biopsy, bone biopsy and bone marrow biopsy in medical and surgical and orthopaedic outpatient departments.
2. Above 18 years of age
3. Those Who could understand and speak Tamil, or English or Hindi, or Malayalam. For associated factors
4. Staff nurses and doctors involved in the selected invasive procedures were selected.

Exclusion criteria:

1. Patients who were mentally challenged.
2. In -patients coming for invasive diagnostic procedures.
3. Patients who were undergoing therapeutic invasive procedures.

Procedure methodology

Survey tool: The patient perception scale developed by investigator to assess the patient perceived quality of care. Part 1: After obtaining written informed consent, data from the recruited patients were collected using a well- designed questionnaire, structured into three parts. The first part focused on the demographic and clinical profiles of the patients, gathering information on variables such as age, gender, education, occupation, residential area, type of visit, and clinical details like diagnosis and diagnostic procedures. Additionally, the demographic profiles of the staff, including doctors and nurses, were collected. This included details such as age (in years) and genderfor both groups.

Part 2: Associated factors were assessed, focusing on both system-related and staff-related aspects. System-related factors included information gathered from patients about waiting time for appointments and procedures, the adequacy of the waiting area, and challenges related to incomplete prescriptions. Staff-related factors were captured using a checklist that gathered data on the qualifications and experience of doctors and nurses involved in invasive diagnostic procedures within the Medical, Surgical, and Orthopedic Outpatient Departments. Additionally, patient load was assessed through direct observation, noting the number of invasive and non- invasive procedures performed in these departments, as well as the daily availability of staff in each area.

Part 3: The Patient Perception Scale, developed by the investigator, was used to assess the perceived quality of care provided to patients undergoing selected invasive procedures. The scale comprised 30 items divided into three subsections: pre-procedural care, care during the procedure, and post-procedural care. Each subsection wasfurther categorized into five dimensions of care:

1. Information, Education, and Communication 2. Physical Comfort and Caring 3. Respect and Dignity

toward Patients4. Emotional Support5. Family Involvement.
2. The pre-procedural care section contained 11 questions. The care during the procedure section had 9 questions.
3. The post-procedural care section included 10 questions.

Responses were recorded using a 4-point Likert scale. After the invasive diagnostic procedure, the investigatorconducted an interview with each selected patient to collect all necessary information.

Statistical analysis

Data entry and analysis were conducted using SPSS version 20. Both descriptive and inferential statisticswere applied to analyse the data.

Descriptive statistics This includes percentage, mean, frequency, and standard deviation which summarize the demographic, clinical variables of subjects and the quality of care. Inferential statistics
1. The Chi-square test was used to find out the association of patient perceived quality of care with the demographic variables of patients and staff.
2. The Chi-square test was used to find out the association between patient perceived quality of care and staff related associated factors such as qualification of doctors and nurses and experience of doctors and nurses.
3. The Kruskal-Wallis test was used to analyse the relationship between patient perceived quality of care and patient load.
4. The Chi-square test was used to find the association between patient perceived quality of care and system related factors such as waiting time for appointment, waiting time for performing procedures, waiting area adequacy and incomplete prescription.
5. The Pearson's Correlation coefficient was used to find out the patient perceived quality of care and waiting time for performing procedures[3]

III. Results

Table no 1 show distribution of patients according to demographic variables (N=140). The majority of patients were over 40years with 61.4%being male. Among them more than half had high school education,77.1%were nonprofessional, a significant proportion lived in rural area and 62.1%were visiting C.M.C.H for the first time.

Demographic Variables	n	%
Gender		
Male	86	61.4
Female	54	38.6
Age		
<25 years	29	20.7
25-40 Years	39	27.9
>40 years	72	51.4
Education		
PG	11	7.9
Graduate	26	18.6
High school	72	51.4
Primary	22	15.7
Illiterate	9	6.4
Occupation		
Professional	32	22.9
Nonprofessional	108	77.1
Residential area		
Rural	92	65.7
Urban	48	34.3
Type of visit		
Old	53	37.9
New	87	62.1

Table 2 show,57.95% provisionally diagnosed with TB,14.3% presented with anaemia for evaluation andthe rest 27.9% had cancer, with 39.3% undergoing bone marrow or bone biopsy and additional 60.7% undergoinglymph node biopsy.

Clinical variables	n	%
Provisional diagnosis		
TB	81	57.9

Anaemia	20	14.3
Cancer	39	27.9
Procedure		
Bone marrow/ Bone biopsy	55	39.3
Lymph node biopsy	85	60.7

Table 3 shows that majority74.3% of doctors who performed procedures were below the age of 30 years and were male 65.7% whereas most of the nurses who attended the patients were female (70.6%) and belonged tothe age group of >30 years were (88.23%).

Demographic variables	**n**	**%**
Doctors age		
<30years	26	74.3
30-40	9	25.7
Gender		
Male	23	65.7
Female	12	34.3
Nurse's Age		
<30yrs	2	11.76
>30years	15	88.23
Nurse's gender		
Male	5	2.4
Female	12	70.6

Table 4 indicates that the majority of doctors who performed procedures were postgraduate registrars(51.43%), while the experience levels among the doctors were evenly distributed, with 15 having less than 2 yearsof experience and 16 having more than 3 years. Additionally, all 17 nurses who assisted in the procedures were diploma holders, with 7 of them having over 15 years of experience.

Associated factors	**n**	**%**
Qualification of Doctors		
Assistant professor	9	25.72
Post graduate Registrar	18	51.43
Intern	8	22.85
Experience in years		
No experience	4	11.2
1-2 years	15	42.85
>3 years	16	45.71
Qualification of nurses		
Diploma	17	100
Experience in years		
<5years	3	17.64
5-15 years	7	41.18
>15 years	7	41.18

Patient load The patient load calculated in the medical, surgical, and orthopedic departments revealed that, on average, each nurse assigned to an outpatient department room cared for 35 patients per day who underwent invasive or non-invasive diagnostic procedures.

Table 5 shows that the majority of subjects waited between 1 to 5 days for their appointment, with 32.1% waiting more than 5 days, while only 9.3% did not have to wait for their procedure. Among the 140 subjects,81 waited less than 2 hours, 33 waited between 2 to 5 hours, and 26 waited more than 5 hours. Additionally, 92.1% found the waiting area adequate, whereas 7.9% reported it as inadequate. Furthermore, 84.3% did not encounter any issues with incomplete prescriptions, while 15.7% experienced problems related to incomplete prescriptions

Associated factors	**N**	**%**
Witing time for appointment		
Zero days	13	93
1-5 days	82	58.6
>5days	45	32.1
Waiting time for performing procedure		
<2 hours	81	57.9
2-5 hours	33	23.6
>5 hours	26	18.6
Witing area adequacy		
Adequate	129	99.1
Inadequate	11	7.9
Incomplete prescription		
Yes	22	15.7
No	118	84.3

Figure 1 Distribution of perceived quality of care among 140 patients,55%perceived the care they received as high quality., 34.29% of them perceived the care as moderatequality, and10.70% perceived the care as low quality.

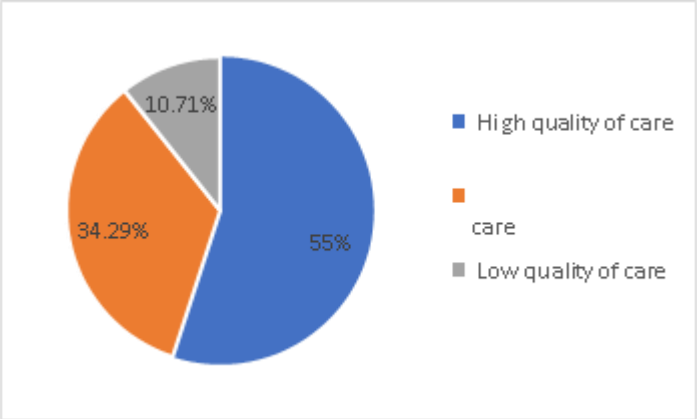

Figure 2 reveals the distribution of perceived quality across three stages of the care process. In pre procedural care 55.7%of patients perceived the quality as high,33.7%as moderate and 8.6%as low. Patient perceived qualityof care is high among 53.6%, moderate among 37.1%low among 9.3% during procedure. post procedure care perceived by patients are high among22.1%, moderate among 23.6 and low among 54.3%

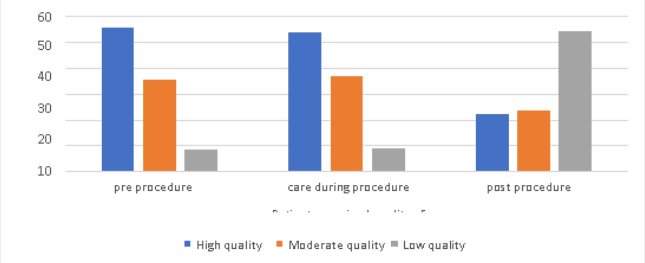

Table 6 illustrates patient perceived quality of care to the domain of information is high for 36.4%, moderate for42.9%, low for 20.7%. for 57.9%of them physical care is high,35.7%moderate and low for 6.4%. respect and dignity revealed high for 66.4%, moderate for 26.4%and low for 7.1%. Emotional support 61.4% perceived high,30.7%moderate and 7.9 perceived low quality of care. Perception of family involvement was high for 67.9%,moderate for 22.1% and low for 10%.

Domains of care	High	Moderate	Low
	%	%	%
Information, education & communication	36.4	42.9	20.7
Physical comfort &caring	57.9	35.7	6.4
Respect& Dignity towards patient	66.4	26.4	7.1
Emotional support	61.4	30.7	7.9
Family involvement	67.9	22.1	10

Figure 3 illustrates patient perceived quality of care those who underwent bone marrow or bone biopsy is high among 56.4), moderate among 25.5% and low among 18.2% participants. patients those who underwent lymph node biopsy 54.1% perceived high-quality care, 40.0% perceived moderate quality care and 5.9% of them perceived low quality care

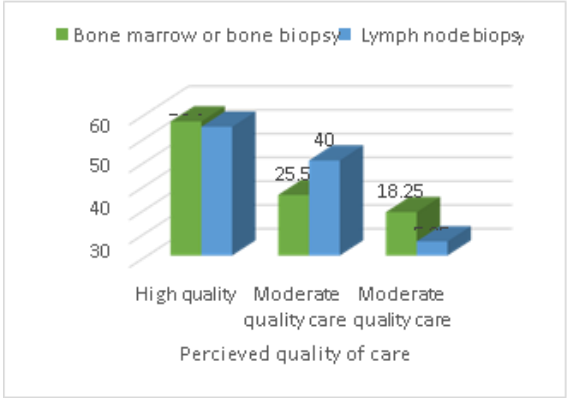

Table 7 shows, there is no significant association found between selected staff associated factors andlevel of quality care using a cut of p-value of .05

Associated factors	High %	Moderate	low	χ^2	P value
Qualification of doctors					
Assistant professor	77.8	11.1	11.1	8.796	.066
Post graduate registrar	44.4	55.6	0		
Intern	37.5	37.5	25.0		
Experience in years					
No experience	50	25	25.0	1.723	.786
1-2 years	53.3	40	6.7		
>3years	50	43.8	6.3		
Experience of nurses					
<5years	66.7	66.7	0	3.331	.504
5-15years	28.6	28.6	28.6		
>15years	14.3	14.3	42.9		

Table 8 shows there is no evidence of statistical association between patient perceived quality of care and waiting time for appointment, waiting area adequacy and incomplete prescription since p-value is >.05. However, there is a significant association found between the perceived quality of care and the waiting time for procedure p-value 0.04. Patients those who waited <2 hours perceived a quality of care.

Associated variable	High %	Moderate %	Low %	χ^2	P value
Waiting time for appointment					
Zero days	30.8	38.4	30.8	7.327	.120
1-5 days	56.1	34.1	9.8		
>5days	60.0	33.3	6.7		
Waiting time for procedure					
<2hours	65.4	24.7	9.9	9.955	.041
2-5 years	39.4	45.5	15.1		
>5years	42.1	50.0	7.9		
Waiting area adequacy					
Adequate	54.3	34.1	11.6	1.456	.483
Inadequate	63.6	36.4	0		
Incomplete prescription					
No	55.9	33.1	11.0	.517	.772
Yes	50.0	40.9	9.1		

Figure 4 Correlation between waiting time for appointment and the patient perceived quality of care show that there is a negative correlation between the patient perceived quality of care and waiting time (r = -.211), as the waiting time is increasing the perceived quality of care is decreasing. The Pearson's correlation test was used to find out the correlation among patient perceived quality of care and waiting time.

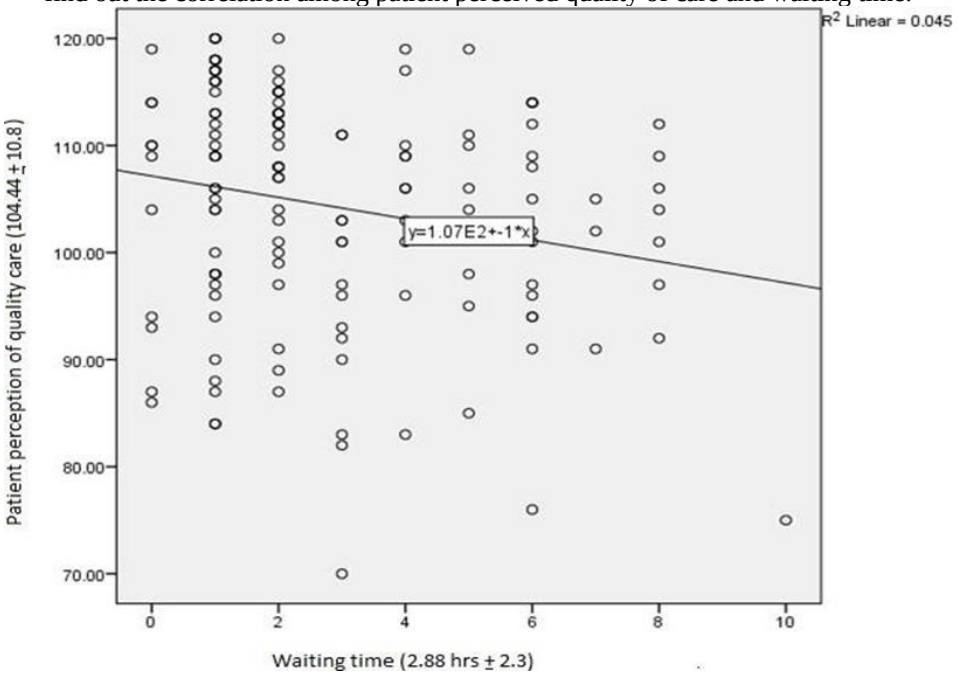

Table 9 indicates that shows there is no significant association between patient's perceived quality of care and demographic variables such as gender, age, education, profession, residential area and type of visit as evidenced by a p-value greater than .05.

Demographic Variables	High %	Moderate %	Low %	χ2	P value
Gender					
Male	53.5	33.7	12.8	1.001	.603
Female	57.4	35.2	7.4		
Age					
<25yrs	65.5	24.1	10.3	4.166	.384
25-40years	43.6	46.2	10.3		
>40years	56.9	31.9	11.1		
Education					
PG	54.5	36.4	9.1	3.253	.918
Graduate	61.5	34.6	3.8		
High school	55.6	30.6	13.9		
Primary	50.0	40.9	9.1		
Illiterate	44.4	44.4	11.1		
Occupation					
Professional	50.0	34.3	15.6	1.122	.571
Non professional	56.5	34.3	9.3		
Residential area					
Rural	54.3	33.7	12.0	0.434	.805
Urban	56.3	35.4	8.3		
Type of visit					
New	54.0	33.3	12.6	0.899	.638
Old	56.6	38.5	7.5		

Table 10 shows no significant association between patient's perceived quality of care and clinical variable of diagnosis as indicated by a p- value greater than 0.05. However, a significant association was found between the patient perceived quality of care and type of procedure as shown by the p-value of less than .05. Patients those who underwent lymph node biopsy procedure perceived a high quality of care.

Provisionaldiagnosis	High %	Moderate %	Low %	χ2	P
TB	51.8	42.0	6.2	7.768	.100
Anemia	65.0	20.0	15.0		
Cancer	56.5	25.6	17.9		
Procedure					
Bone/marrow biopsy	56.4	25.4	18.2	6.806	.033
Lymph node biopsy	54.1	40.0	5.9		

Table 11 shows that there is an association between the doctor's gender and patient perceived quality of care. Patients those who were taken care by male doctors were perceived a high-quality care.

Doctor's Age	High	Moderate	Low	χ^2	P value
<30years	42.3	50.0	7.7	4.250	.119
>30years	77.8	11.1			
Gender					
Male	60.9	26.1	13.0	5.974	.050
Female	33.3	66.7	0.0		
Nurse's age					
<30years	50.0	50.0	0	1.036	.596
30-40 years	26.7	40.0	33.3		
Nurses gender					
Male	60.0	20.0	20.0	3.238	.198
Female	16.7	50.0	33.3		

IV. Discussion

This study was conducted with the purpose of assessing patient perceived quality of care and the associated factors during selected invasive diagnostic procedures in outpatient departments.

The demographic data of the patients show that 51.7 % were above 40 years old, 61.4% were male,51. 4%, had high school education 77.1 % were non-professionals. Most lived in rural areas and 62.1% were first time visitors to Christian Medical College, Vellore. The study assessed clinical variables revealing that of 140 patients, 57.9% were provisionally diagnosed to have TB, 14.3%with anaemia, and 27.9% with cancer, with

39.3% undergoing bone marrow/bone biopsy and 60.7% undergoing lymph node biopsy. The demographic variables included doctors and nurses' gender and age. Most doctors were under 30 years and 65.7% were male, while 70.6% of nurses were female and 88.23% were over 30years old with a higher than the global average of 29.4% male nurses were participating in the study, indicating a possible increase in the male nurse ratio. Majority of the doctors (51.43%) performing procedures were post graduate registrars with 42.85% having less than 2 years of experience. A similar study by Zgierska, Rabago, & Miller (2014)[4] found that 16 % post graduate doctors over 2 years of experience while the rest were local physicians with less than 2 years indicating that more junior doctorswere involved in the procedures like biopsies.

All (17) nurses (100%) who assisting in the procedures were diploma holders with 41.18% having over o15 years of experience. According to the Central Bureau of Health Intelligence (2011)[5], a larger number of nurses in India are diploma holders and this is relevant to the present study findings. Despite each staff member handling an average of 35 procedures daily, the outpatient department at CMCH had adequate staffing per INC and TNNMC.

Analysis of System related factors showed that most patients waited 1-5 days for an appointment and 32.1 % waited over 5 days and few getting done immediate procedures. Of 140 patients 57.9% waited less than 2 hours for their procedure, 23.6% waited 2-5 hours, and rest of them waited over 5 hours. The study assessed system related factors like waiting area adequacy and incomplete prescriptions, most patients were satisfied with the waiting area and no issues with the prescriptions, despite this patient were most focussed on completing theirprocedures than comfort.

The overall quality of care was rated as high by 55% of patients, moderate by 34% and low by 11%.

The study conducted by Surg and Bring (2013)[6] in Pune Armed Forces Medical College regarding outpatient service satisfaction and quality of care showed that the overall satisfaction about the quality of care was excellent among 63%, good among 18%, moderate among 18% and poor among 1% of respondents. Though substantial perceptual differences existed among the respondents in respect of certain attributes, most of them were highly satisfied with the information they received and the waiting time. These findings are similar to the present study in terms of the overall quality of care perceived by patients.

The study revealed that while over 50% of patients perceived high quality care before (57.7%) and during (53.6%) the procedure, only 21.1%felt the same about post-procedure care, highlighting a lack of attention to providing appropriate post procedural information and instructions,

Patient perceived quality of care in different domains, the perception revealed that more than 50 % (55.7%, 53.6%) received high quality of care before and during procedures, Whereas, only 22.1%of them perceived that post procedural quality care was as high. It was evident from this study that patients were not properly attended after the procedure with regard to appropriate information and instructions in relation to post procedural care that has to be followed at home.

The assessment of care quality of for patients undergoing bone marrow and lymph node biopsies revealed 54.1% and 40.0% of lymph node biopsy perceived high and moderate quality care respectively, while 18.2% of patients who underwent bone marrow biopsy reported low quality of care, likely due to higher pain levels.

The study found a significant association between perceived quality of care and waiting time for procedures, with a p-value of 0.004. Patients were dissatisfied when services were not provided at the scheduled time, showing a negative correlation between perceived care quality and waiting time ($r = -.211$). As waiting time increased, the quality-of-care perception decreased. The findings highlight importance of explaining delays to patients, which may help to reduce dissatisfaction with extended waiting periods.

A similar study was conducted by Bleustein,(2014)[7], involving 11,352 survey responses from 44 ambulatory clinics over one year, revealed that longer wait times were negatively correlated with patient satisfaction scores and resulted in a decrease in perceived quality of care.

The study found no significant association between perceived quality of care and demographic variables like gender, age, education, or profession, with all patients receiving equal treatment regardless of these factors. No significant association was found between perceived quality of care and patients' residential background, indicating equal care for all, whether new or returning patients.

The study found no association between perceived quality of care and patient diagnosis, doctor's or nurse's age, or nurse's gender, but a significant association with the type of procedure, with lymph node biopsy patients perceiving higher care quality, and with doctor's gender affecting care perception($p=0.05$) A study by (Delgado, Lopez-Fernandez, & Luna, 1993)[8] on 86 doctors and 860 patients from urban areas in Andalusia, Spain found a significant association between doctor's gender and perceived quality of care ($p < 0.005$), consistent with the findings of the present study. The (Peck & Peck, 2012)[9] study found that patients treated by male doctors reported lower satisfaction and perceived quality of care, suggesting that female doctors exhibit a more caring attitude, which supports the present study's findings. Additionally, the study revealed no significant association between nurse's age or gender and perceived care quality.

V. Conclusion

The study found a significant association between patient-perceived quality of care and system-related factors like waiting time. While overall care standards were high, improving communication and physical support is necessary to enhance perceived quality.

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