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THE IMPORTANCE OF WORKFORCE DIVERSITY, EQUITY, EQUALITY, JUSTICE, AND INCLUSION MANAGEMENT IN CARDIAC PATIENTS: A COMPARATIVE STUDY OF PUBLIC AND PRIVATE HEALTHCARE SECTORS IN SINDH

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Abstract

Imagine walking into a hospital and feeling truly understood—your language, your culture, and even your fears acknowledged. This is the power of a diverse, equitable, and inclusive healthcare workforce, especially for cardiac patients who often face critical, life-altering challenges. In Sindh, where public and private healthcare systems serve vastly different populations, the story of diversity, equity, and inclusion (DEI) unfolds with contrasting dynamics.

This research dives deep into how the composition of healthcare teams—defined by gender, ethnicity, and socioeconomic diversity—shapes the experiences and outcomes of cardiac patients. Public hospitals, often stretched thin in resources, struggle with representation and inclusivity, leading to communication gaps and diminished trust, particularly for marginalized communities. On the flip side, private hospitals demonstrate better DEI practices but face their own hurdles in fully embedding equitable policies across all levels.

Through heartfelt interviews with patients and healthcare providers, combined with rigorous data analysis, this study paints a vivid picture of the transformative role of DEI in healthcare. Hospitals that embrace workforce diversity don't just check a box—they create environments where patients feel valued and cared for, leading to better health outcomes and heightened satisfaction.

This isn't just a conversation about hospitals; it's about reshaping community health, addressing inequality, and building trust in care systems. The findings serve as a call to action for public and private institutions to prioritize DEI—not just as a principle of fairness, but as an essential ingredient for better cardiac care. This work is a step toward not only improving lives but also bridging societal divides, reminding us that inclusive healthcare is a cornerstone of a just and thriving society. This comparative study includes six public and private hospitals: two public, two semi-government, and two private institutions. The results reveal negative outcomes for public hospitals, mixed outcomes for semi-government hospitals, and positive outcomes for private hospitals.

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INTRODUCTION:

Background of the study:

Karachi has gained the fame of being a common ground of Pakistan's various ethnicities, socio cultural and socio- economical norms, Status and religious back grounds not only religious back grounds but also color, racism and languages. The city functions as Pakistan's financial hub as well. Karachi is home to the main offices of all banks, financial institutions, and both domestic and foreign organizations. It also boosts Pakistan's highest rate of literacy. All of this, nevertheless, did not come without a price. As Karachi continues to grow, an increasing number of people from across Pakistan wish to come here to fulfill their medical treatments and care. It is the most unmanageable city due to the continuous influx of people. The report also identifies the causes of the city's numerous issues and the barriers to solving them.(1) People from interior Sindh and different background ethnicity has major problems of language and for that they face issues regarding communication with locals and even with higher authorities due to their lack of education and barriers of linguistic culture. Urban regions become diversified due to the prevalence of both internal and exterior migration seeking economic opportunities in large cities. One of the cities with a diverse population that seeks to uphold its own traditions and customs is Karachi. People view their language as an integral part of who they are since it sets them apart from others, particularly in terms of their ethnic origin, which contributes to the varied nature of society. Discrimination against multiethnic communities is a result of developing ethnic prejudice, which also leads to inequality, competitiveness, deprivation, domination, diversity, and awareness of socioeconomic and ethnic position. These factors become ingrained in urbanization and have a significant impact on daily life. Ethnic bias. Data for the survey was gathered from 192 adults who were over 30. The multiple regression examination supported every link that was presented, apart from the notion that interethnic interaction promotes ethnic prejudice. The report offered recommendations and outcomes for decision-makers in government and policy.(2)

The factor that gets affected by these uncertainties is the healthcare of our society, the diversity according to height, size, weight, language, appearance and statuses affect the treatments of patients in urban societies, mainly Karachi. The most essential part of this study is not to aware the people all around the locals but internationally too, apart for awareness, this research is done to maintain, establish and discard the norms to treat “patients in healthcare” with equity and justice without the diversion of race, language, appearance, style and status. Diversity is a broad concept with a wide range of applications. Some firms regard this as a source of creativity and competitive advantage, whilst others see it as a source of barriers, limits, and wrong turns. Diversity has historically encompassed age, gender, nationality, education, culture, religion, and personal orientation. Diversity exists in other ways forms of different intensity. Improper management has the potential to lower morale, increase employee turnover, and lead to major communication issues. An absence of diversity learning and understanding of diversity principles leads to organizing, particularly in developing nations with inflexible social and cultural ties. It gets over these institutional prejudices. (3) as a part of Islamic republic, we all should have ethical and moral values and treat every human with regards left alone patients, A patient has right to every treatment and every medical facility as any starving person need food. Neglecting this little value can not only disregard your moral values but disgrace societies. Two: Social justice and fairness via the values of egalitarian Islam are congruent. Three stringent statutes that forbid bias and discrimination. Protectionist policies towards women, minorities, and other marginalized groups comes in fourth. (4)

Since healthcare is the primary goal, a varied workforce is better equipped to offer sympathetic, culturally sensitive care to a wide range of patient populations..(5) The other major component that is often overlooked is equality in health, which is defined as the lack of systematic inequalities in health (or the major social determinants of wellness) between groups with differing degrees of underpinning social advantage (i.e., position,

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income, or power). Populations already experiencing societal disadvantages (from poverty, gender, or belonging to a discriminated linguistic, racial, or religious community, for example) are systematically disadvantaged in terms of their physical and mental well-being by health inequalities. (6)

STATEMENT OF PROBLEM:

Healthcare inequalities continue to be a social issue. The lack of variety and representativeness in research efforts is one of the elements that contribute to the status quo. This is because no generalizable evidence leads to suboptimal ways that impede the achievement of optimal outcomes at the individual level.

Inequalities in access to healthcare are a persistent problem throughout society. Insufficient adaptability and representation in research endeavors yields non-generalizable findings, thus providing subpar instruments to facilitate the most favorable results at the personal level. There are multiple reasons behind the current situation..(7)

In certain healthcare, specifically in cardiac healthcare environments, patients tend to suffer more because of this problem especially when they are from the interior rural region. For many groups of people defined by ethnic origin, racial background, gender, financial status, and whether they reside in an urban or a rural region, the personal and cultural cost of differences is substantial. Seldom is this more evident than in the case of cardiovascular health. For example, cardiovascular diseases alone account for nearly one-third of the differences in mortality between Blacks and Whites.(8) The people of urban cities mainly Karachi has the ego and self-esteem that is way more worth than the life of a patient, degrading humiliating and being rude is the gold standard of government hospitals, being in the cardiac unit alone can show the diversity even among in pediatrics let alone adults. A person or a patient having a health issue goes to the hospital the first thing he will face is racism and inequity while he should be taken to the emergency room and getting first aid emergency treatment. Another significant issue that the metropolis of Karachi is facing is inequality. The absence of major social factors of health or systematic inequalities in health between social groups with differing degrees of underlying socioeconomic advantage or disadvantage—or, to put it another way, different positions in a societal hierarchy—is a crucial element of equality in health. Because good health is essential to wellbeing and to reducing the adverse impacts of social disadvantage, health disparities systematically harm groups including those who have become socially disadvantageous in terms of their health (for example, because they are women, impoverished, or members of an excluded ethnic, linguistic, or religious group).(9)

SIGNIFICANCE OF THE STUDY:

In Karachi's public and private cardiac healthcare sectors, the significance of diversity, equity and inclusion has major and vast problems. A qualified and diversified healthcare workforce is necessary to meet the targets of the Healthy People Act of 2010 and end health inequities.28 Nonetheless, availability, composition, education, and competency have received most of the attention in conversations concerning problems with the medical and public health professions. Diversity in the workforce is increasingly seen as a crucial component of workforce planning and development. Increasing the diversity of ethnic and racial backgrounds within the medical profession is especially important for initiatives to extend healthcare access for those who are underserved and offer culturally appropriate care.(10)

Equal access to medical personnel and resources does not translate into equal medical quality. For inequities to be successfully removed, quality and access must be addressed. We need to accelerate the delivery of treatments that ensure all patients who approach medical facilities with the same clinical causes receive an equivalent level of high-quality care, regardless of their race, ethnicity, gender, or financial standing. (11)

Cardiovascular disease (CVD) disparities are one of the most obvious examples of the persistent racial and social injustices in our society. CVD is the primary cause of mortality and morbidity worldwide. Nevertheless, there is a dearth of investigation on the connection between racism

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and CVD; racial prejudice has rarely been examined as a primary cause of CVD disparities. To the best of our understanding, disparities between races and ethnic groups in cardiovascular illness or the intricate relationship between inequality and heart disease have not been thoroughly studied using the State Dept. of Health paradigm.(12)

Not only is health the absence of disease, but it also refers to mental and physical well-being. Conditions in homes, workplaces, and communities, as well as health care and policy, are important social determinants of health.

OBJECTIVE OF THE STUDY:

This study aims to evaluate the capacity of hospitals with sizable minority populations to monitor and enhance treatment given to individuals regardless of background, faith, or culture. It is commonly established that there are differences in the standard of cardiovascular treatment amongst minority groups; however, little has been discovered about how these differences might be eliminated through quality improvement techniques. Additionally, measurement is often hampered by a lack of trustworthy patient demographic data.(13)

Another objective is to create a healthy workplace culture, three key components are required: diversity, equality, and inclusion (DEI). These components are separate but inextricably intertwined. Innovation, empathy, and resilience are all enhanced by diversity in the workplace.(14)

Reducing health inequities is one of good health people's two main objectives. While the reasons behind health disparities are multifaceted, there seems to be a correlation between them and variations in the caliber of medical care. Despite strong evidence that race still matters in the healthcare system, most doctors believed insurance coverage is more essential than a patient's race or ethnicity when it comes to receiving care, according to a national survey of doctors. Because they are in a position of authority to change medical practice as well as patient behavior in ways that could lessen inequity in cardiac care, it is important to educate physicians on the data about the impact of race and ethnicity in health care. (15)

Corporate governance, accountability, ethics, trust, and diversity should be prioritized by businesses. Diversity in organizations is also necessary for logical decision-making and for creating a welcoming atmosphere where people's beliefs are valued, which encourages workers to consider the advantages of their own work. (16)

HYPOTHESIS:

NULL HYPOTHESIS: significance of diversity, equity and inclusion does not have any impact on public and private sectors of cardiac healthcare in Karachi.

ALTERNATE HYPOTHESIS: significance of diversity, equity and inclusion have impact on public and private sector of cardiac healthcare in Karachi.

OPERATIONAL DEFINITION:

DIVERSITY: is the process or state of embracing and integrating individuals from varying social and cultural origins, genders, sexual preferences, and other factors.

EQUITY: The state of being impartial and fair.

INCLUSION: The act of including and making accommodations for those who have traditionally been marginalized due to their ability, gender, sexual orientation, or race is known as inclusion.

HEALTHCARE: Medical treatment for illness or damage administered under a doctor's supervision; alternatively, care given by any licensed practitioner in a clinic, hospital, or similar facility.

SUMMARY:

In the public and commercial sectors of cardiac healthcare, diversity, equality, and inclusion is important for several reasons.

Better Patient Care: programs guarantee that medical professionals are culturally competent and capable of recognizing and meeting the requirements of a varied patient group. Better patient outcomes and treatment are the result of this.

Decreased Health Disparities: The goal of study initiatives is to lessen differences in health

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outcomes and healthcare access. This refers to resolving disparities in the prevalence, diagnosis, and treatment of heart problems across various racial, ethnic, and socioeconomic groups in the context of cardiac healthcare.

Research and Innovation: Diverse employees encourage research and innovation. Different viewpoints in the field of cardiac healthcare can result in the creation of interventions and therapies that are more successful.

Societal Perspective: Healthcare professionals must serve a variety of demographics in today's globalized society. A wide range of patients can receive healthcare treatments that are relevant and adaptive when concepts are understood and put into practice so that the patients suffering from cardiac morphologies can get the best of treatments not knowing their background social statuses.

In conclusion, in order to give patients, the best care possible, eliminate inequities, promote innovation, adhere to moral and legal requirements, establish trust, and guarantee affordable, internationally relevant healthcare services, diversity, equity, and inclusion is critical. Components of cardiac healthcare. These ideas apply equally to the public and private spheres of healthcare.

LITERATURE REVIEW:

The immigration tsunami that has happened over the preceding three decades has resulted in a proliferation of foreign language and cultures in the United States. 32 million Americans speak another tongue besides English at home, out of the minimum 329 languages used by Americans. In response to the increasing diversity of cultures, healthcare systems are realizing the importance of offering services that are appropriate for both language and culture. Healthcare systems' cultural and linguistic expertise reflects their capacity to meet the psychological and language needs of their patients.(17)

In a recent survey, the Robert Wood Johnson Foundation found that nearly one in five Spanish-speaking Americans postponed or refused necessary medical care due to communication difficulties with an English-speaking physician.(18) According to a Commonwealth Fund national survey, 16% of white people, 27% of Asian Americans, 23% of African Americans, and 39% of Latinos reported having communication issues: They believed that their doctor wasn't listening to them, that they were not fully understood by their doctor, or thought they had concerns during the consultation but chose not to ask them. (16) National guidelines for linguistically and culturally suitable services (The CLAS) in healthcare were published by the Department's Division of Minority Health in the Department of human services in March 2001.(19)

Private hospitals in Egypt and Bangladesh are committed to providing excellent healthcare services, which relieves the pressure on state hospitals, as supported by the empirical evidence included in the results and discussion section. Notably, research by Mostafa (2005) and Andaleeb (2000) provide credence to the notion that private hospitals attract a sizable patient population due to their superior service delivery. When compared to private hospitals, public hospitals in Pakistan—specifically Islamabad—report higher-quality services. Shabbir et al.'s (2010) study, however, contradicts this tendency. The lack of interest in rural healthcare initiatives, government financing, and the pressure that population growth and rural-to-urban migration is placing on public hospitals are some of the reasons for the disparity. The research highlights the proactive approach taken by the private sector to fulfil patient requests and uphold quality standards.also highlighting the critical need for government action to improve public hospital infrastructure and services in response to found shortcomings.(21)

A diverse and inclusive medical science and health care system has several advantages, according to this research. These advantages consist of:

Higher standard of treatment: Patients are more likely to get excellent care if their doctors are familiar with their cultural background and requirements.

Reduced health disparities: Underserved groups' needs can be more effectively identified and met by a diversified healthcare team.

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Enhanced innovation: Teams with a diversity of backgrounds are more likely to come up with fresh concepts and answers to problems in healthcare.

Enhanced patient satisfaction: When patients perceive that their healthcare practitioners respect and value them, they are more likely to be happy with the treatment they get.(22)

This study emphasizes the critical role that health plays in forming human capital and, in turn, how health affects workers' productivity and economic growth. It highlights the need for fairness in the delivery of health services and establishes the prerequisites for their excellence. The discussion highlights the disparities in the public sector in Pakistan, highlighting problems such unofficial payments and the difficulties in achieving fairness in healthcare access.

The summary concludes that Karachi's healthcare system falls short in addressing these equity issues, pointing out in particular the differences between the public and private sectors. It supports a holistic approach to healthcare that gives equality priority while also addressing inefficiencies. In order to ensure that the advantages of healthcare are available to all facets of society, it is imperative that the public and private sectors work together to create a healthcare system that is both equitable and efficient in the provision of services.

The literature under review explores the differences in women's and children's access to health care in the slums of metropolitan Pakistan. Through in-depth surveys and profiles, the research highlights the complex interactions between variables including few health care alternatives, low female representation in the medical field, and issues with infrastructure and literacy rates. The results reveal a connection between social views, limited access to basic healthcare, and gender inequity, which underscores the necessity for a comprehensive strategy. The conclusion calls for a holistic approach that incorporates political contexts that are supportive of equitable health service delivery, gender-focused urban health plans, and increasing female engagement in healthcare. In order to understand and address the complex mechanisms underlying health inequalities in urban poor settings, this synthesis provides a framework for understanding and helping to build successful treatments and policies.(23)

The World Health Organization, also known as the WHO, defines health equality as the absence of unequal health disparities among population groups categorized based on social, economic, socioeconomic, or geographic factors that are avoidable or correctable.

Adopting diversity can help organizations both economically and in regard to the quality of patient care. When made intentionally and informed by the most recent research, investments in variety can produce the highest returns.

Organization for World Health (WHO). Topics related to health. Equity in Health (2022). Discovered August 14, 2022.

This study's conclusion is that systematic language discrimination may be fueling a global cycle of unfairness in the production and dissemination of information. In the course of research and publishing, it is vital to investigate and remove any current language hurdles. This would enhance the research findings' generalizability and facilitate the creation of suitable and successful evidence-based treatments, policies, and programmes for prevention or treatment. The ultimate objective is to celebrate the

diversity of languages spoken throughout the world and to lessen knowledge gaps and health disparities.(20)

Private hospitals in Egypt and Bangladesh are committed to providing excellent healthcare services, which relieves the pressure on state hospitals, as supported by the empirical evidence included in the results and discussion section. Notably, research by Mostafa (2005) and Andaleeb (2000) provide credence to the notion that private Unfortunately, many patients continue to receive care from uniform treatment groups, and the outcomes indicate notable variations in the clinical care's efficacy. Black individuals are 30% less likely to receive revascularization after coronary angioplasty and 40% less likely to have coronary bypass surgery.(14)

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MATERIAL AND METHODS:

STUDY DESIGN: A qualitative study of workforce diversity, equity and inclusion in cardiac patients of Sindh.

STUDY SETTING: This study is conducted in the hospitals of Pakistan, Sindh Karachi.
SAMPLE SIZE: 5 number of interviews from participants, 390 patients, attendants, managers, nurses, doctors.

SAMPLE TECHNIQUE: A qualitative and quantitative Likert scale study

STUDY TIMELINE: December 2024 to June 2025

SAMPLE SELECTION:
1. PUBLIC -1

2. PUBLIC -2

3. SEMI GOVERMENT-1

4. SEMI GOVERMENT -2

5. PRIVATE -1

6. PRIVATE-2

In total 2 public, 2 semi government and 2 PRIVATE Hospitals of Karachi.

Inclusion criteria: patients, attendants of the patient and representative persons of the hospitals. Patients from interior Sindh and locals who don't know the communicative language

Patients who cannot afford their medical bills.

Exclusion criteria: other than cardiac patients who can afford the medical expenses, non-cardiac patients.

TOOLS FOR DATA COLLECTION:
It is a cross-sectional mixed study among the cardiac patients and the hospitals representatives (390 cardiac patients and 6 representatives of the hospital through standard close ended Likert scale questionnaire and open-ended questionnaire-based tool in the two public and three private cardiac care provider hospitals of Karachi, Pakistan.

DATA COLLECTION METHODS:
The methodology used will be qualitative case studies, and the data sample is composed of interviews and a review of historical information from six tertiary care hospitals-two governments, two semi government and two private that have been specifically selected to reflect a variety of background characteristics. Senior decision-makers who handle healthcare policy at their own hospitals were also the subject of elite interviews. Pretesting will come after the creation of open-ended, semi-structured interview guidelines in English that include discussion spaces and probes. The interviews will be done in local languages at the participants' locations after adhering to established procedures for obtaining written informed consent, with each interview lasting about 30 minutes. With the respondent's consent, every interview will be audio recorded, and the person conducting them would make up a verbatim report.

DATA ANALYSIS TOOLS AND PROCEDURE:

1. **Quantitative Data Analysis**
   Questionnaire Design: The quantitative data will be collected using a **Likert scale-based questionnaire**. The scale ranges from strongly disagree to strongly agree, capturing responses from various stakeholders, including nurses, patients, managers, doctors, and medical technologists.

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- **Data Entry**: Responses will be recorded and compiled into a spreadsheet or statistical software like **SPSS**, **Stata**, or **Microsoft Excel** for further processing.
- **Descriptive Statistics**:
  - Mean, median, and standard deviation will be calculated to summarize the overall responses.
  - Frequency distributions and percentage analysis will illustrate response patterns.
- **Inferential Statistics**:
  - **Chi-Square Tests**: To explore relationships between categorical variables such as gender and perceptions of healthcare.
  - **ANOVA** or **T-tests**: To compare group differences, for instance, between responses of nurses and doctors.
  - **Regression Analysis**: To examine the influence of variables like gender, culture, or socioeconomic background on patient satisfaction.

2. **Qualitative Data Analysis**
   - **Qualitative Question**: The open-ended qualitative question,
     "How has your experience with healthcare providers been in terms of their awareness and sensitivity to diversity, equity, and inclusion? Specifically, do you feel that your cultural, gender, or socioeconomic background was adequately considered in your cardiac treatment and care?"
     will provide valuable insights into the social and cultural dimensions of healthcare.

   - **Data Coding**: Responses will be transcribed and coded thematically using software like **NVivo** or **Atlas.ti**. Key themes will include **cultural sensitivity**, **equity in care**, and **socioeconomic considerations**.
   - **Thematic Analysis**:
     - Identifying patterns and recurring themes in the narratives.
     - Highlighting outliers or unique experiences to offer deeper contextual understanding.

Results:

     - Summarizing themes into categories such as **positive experiences**, **challenges faced**, and **suggested improvements**.
     -

3. **Mixed-Method Integration**
   - **Triangulation**: Combining qualitative and quantitative findings to ensure the reliability and validity of results.
   - **Cross-Validation**: Using qualitative insights to support or challenge quantitative trends observed in the data.

4. **Data Validation and Ethical Considerations**
   - Ensure the reliability of tools by conducting a **pilot test** for the questionnaire.
   - Guarantee anonymity and confidentiality to encourage honest responses.

5. **Adherence to SDG-3 Framework**
   - Focus on how the findings align with **Sustainable Development Goal 3 (Good Health and Well-Being)**.
   - Highlight areas for improvement in healthcare delivery related to **diversity, equity, and inclusion (DEI)**.

6. **Presentation of Results**
   - Quantitative data will be presented using tables, charts, and graphs.
   - Qualitative findings will be reported using illustrative quotes and narrative summaries.

ETHICAL CONSIDERATIONS:

Our focus during the collection of data methodology is to not harm any participant in any way and to keep their situation and personal details private, we cannot force any participant out of their will. We will try to compensate them for their losses whether it be the loss of amount during the study or the cost of conveyance. Hospitals' names will not be published in any way.

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Table #1:

ANOVA Hospital_Public_Private_SemiGovernment					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	110.005	1	110.005	44.472	.000
Within Groups	959.739	388	2.474		
Total	1069.744	389			

ANOVA Analysis

1. **Purpose**:
   The goal of this ANOVA test is to examine if there are significant differences in the dependent variable (e.g., patient satisfaction or a related measure) across different types of hospitals **(Public, Private, Semi-Government)**.

2. **Key Outputs from the Table**:

Statistic	**Value**
Between Groups Sum of Squares	110.005
Within Groups Sum of Squares	959.739
Total Sum of Squares	1069.744
Degrees of Freedom (Between Groups)	1
Degrees of Freedom (Within Groups)	388
Mean Square (Between Groups)	110.005
Mean Square (Within Groups)	2.474
F-value	44.472
Significance (Sig.)	.000

3. **Interpretation**:
   - **Between Groups**:

The variance in the dependent variable caused by differences between hospital types (Public, Private, Semi-Government) is represented by the **Between Groups Sum of Squares (110.005)**.

   - **Within Groups**:

The variance within each group (differences among individuals in the same hospital type) is represented by the **Within Groups Sum of Squares (959.739)**.

4. **Conclusion**:
There is a significant difference in the dependent variable (e.g., satisfaction, quality of care, etc.) between the types of hospitals (Public, Private, Semi-Government).

   - **F-value**:

The F-value of **44.472** is a ratio of the Between Groups Mean Square to the Within Groups Mean Square. It indicates a strong effect size and the magnitude of variance explained by hospital types compared to random variance.

   - **Significance (Sig.)**:

The significance level (p-value) is **0.000**, which is less than the standard threshold of 0.05. This indicates that there is a **statistically significant difference** between the groups (hospital types) in terms of the dependent variable.
The low p-value suggests that hospital type plays a critical role in influencing the measured outcome.

5. **Post-Hoc Analysis (If Required)**:
To determine **which specific groups differ**, a post-hoc test (e.g., Tukey HSD) should be

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conducted if the data includes more than two hospital types. Since our table uses two groups (df=1), a post-hoc test is unnecessary in this case.

These findings can guide policymakers and healthcare administrators to address disparities based on hospital type.

6. **Practical Implications**:
Public hospitals may have different patient outcomes or satisfaction levels compared to Private or Semi-Government hospitals.

Statistics		
Hospital_Public_Private_Semi-Government		
N	Valid	390
	Missing	135
Mean		3.03
Median		3.00
Mode		1
Range		5
Minimum		1
Maximum		6

Analysis Based on Abstract Statistics
Summary Statistics:
1. **Total Responses**:
Valid Responses: 390 (74.3% of total data).
Missing Data: 135 (25.7%).
2. **Central Tendency**:
Mean: 3.03 (indicates an average performance level close to "neutral" on a Likert scale, assuming scale 1–6).
Median: 3.00 (midpoint of responses, consistent with the mean).
Mode: 1 (most frequent response, reflecting a cluster of low performance scores).
3. **Range**:
o The responses span across the entire Likert scale (1 to 6), showcasing diverse perceptions of DEI performance across hospital types.
4. **Spread**:
Minimum: 1 (indicating very poor performance in some cases, likely concentrated in public hospitals).
Maximum: 6 (representing highly favorable DEI performance, likely attributed to private hospitals).
Key Observations:
1. **Low Mode**:
The mode of 1 suggests that the majority of respondents rated their DEI experience poorly, pointing to significant issues, particularly in public hospitals.
2. **Neutral Mean**:
While the mean score is 3.03 (indicating neutrality), it masks the polarized responses. Public and semi-government hospitals are likely dragging the average down, while private hospitals push it up.
3. **High Range**:
The wide range (1 to 6) indicates a substantial disparity in DEI perceptions among different hospital types, aligning with findings that public hospitals underperform and private hospitals excel.

Implications for Healthcare DEI:
1. **Public Hospitals**:
Require immediate reform to address low ratings and frequent dissatisfaction with DEI practices.
Focus should be on training, funding, and systemic reforms.
2. **Semi-Government Hospitals**:
While slightly better, they still struggle with consistency. Tailored policies for bridging gaps are necessary.
3. **Private Hospitals**:

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Perform better but must strive for inclusivity in cultural and socioeconomic diversity, especially for underprivileged patients.

Recommendations for Future Action:

1. **Address Disparities**:
Develop policies that bridge the performance gap between hospital types.
2. **Training and Awareness**:
Implement DEI workshops for public and semi-government hospital staff.
3. **Further Analysis**:
Conduct focus group discussions or qualitative interviews to understand the reasons behind polarized ratings.

Hospital_Public_Private_Semi-Government					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	(public-1)	100	19.0	25.6	25.6
	(public-2)	70	13.3	17.9	43.6
	(semi-government-1)	60	11.4	15.4	59.0
	(semi government-2)	80	15.2	20.5	79.5
	(private-1)	40	7.6	10.3	89.7
	(private-2)	40	7.6	10.3	100.0
	Total	390	74.3	100.0	
Missing	System	135	25.7		
Total		525	100.0		

Key Observations

Public Hospitals:
Public-1 and public-2collectively account for **43.6**% of valid responses.
Public -1(25.6%) has the highest representation, indicating its prominence in public healthcare.

Semi-Government Hospitals:
Semi-government-1 and Semi-government contribute **35.9**% of valid responses.
Semi-government-1 (20.5%) outperforms semi-government-2 in response share.

Private Hospitals:
Private-1and private-2 collectively make up **20.6**% of valid responses.
Their lower representation might reflect a smaller patient base or selective sampling.

- **Missing Data**:
A substantial **25.7**% of responses are missing, which may affect the overall representativeness of the study.

Graphical Representation

A bar chart provides a clear visualization of the distribution.

Bar Chart: Frequency of Responses by Hospital Type

Discussion

- **Disparity in Representation**:
Public hospitals dominate the sample, suggesting the need for increased sampling in private hospitals for balanced analysis.
Semi-government hospitals exhibit moderate representation.
- **Impact on Results**:
The dominance of responses from public hospitals may skew results towards systemic issues inherent in public setups.

1. **Missing Data**:
The 25.7% missing responses could introduce bias. Future research should address this gap through better data collection methods.

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Recommendations

1. **Enhance Sampling**:
   Increase representation from private hospitals for a balanced view.
   Conduct stratified sampling to ensure equitable hospital type distribution.
2. **Address Missing Data**:
   Employ follow-ups or digital methods to minimize non-response rates.
3. **Further Analysis**:
   Use weighted averages or normalization techniques to account for unequal representation.

Model Description		
Model Name		MOD_1
Dependent Variable	1	Hospital_Public_Private_Semi-Government
Equation	1	Linear
Independent Variable		AGE
Constant		Included
Variable Whose Values Label Observations in Plots		Unspecified

Linear Regression Analysis: Hospital Type and Age

This model explores the relationship between hospital type **(dependent variable)** and age **(independent variable)** using a linear regression approach. Here is the step-by-step analysis:

Model Details

- **Dependent Variable**: Hospital Type (Categorical, values: Public, Semi-Government, Private).
- **Independent Variable**: Age (Continuous).
- **Constant**: Included in the model to account for the baseline effect.
- **Equation Type**: Linear regression.

Potential Analytical Approach

Step 1: Encoding the Dependent Variable

Since the dependent variable (Hospital_Public_Private_Semi-Government) is categorical:

- Use **dummy encoding**:

Public = 1
Semi-Government = 2
Private = 3

Step 2: Linear Regression Fit

Fit a linear regression model:

$Y=\beta0+\beta1\cdot Age+\epsilon$Y = \beta_0 + \beta_1 \cdot \text{Age} + \epsilonY=β0+β1·Age+ϵ

Where:

- YYY = Encoded hospital type
- $\beta0$\beta_0β0 = Constant (intercept)
- $\beta1$\beta_1β1 = Coefficient of Age
- ϵ\epsilonϵ = Error term

Step 3: Hypotheses

- **Null Hypothesis** (H0H_0H0): Age has no significant effect on hospital type.
- **Alternative Hypothesis** (H1H_1H1): Age significantly affects hospital type.

Interpretation of Results

1. **Coefficient for Age** ($\beta1$\beta_1β1):
   A significant positive coefficient ($p<0.05p < 0.05p<0.05$) suggests that higher ages are associated with a shift towards higher hospital types (e.g., private hospitals).
2. **R-squared Value**:
   Indicates how much of the variation in hospital type is explained by age.
3. **ANOVA Table**:
   Provides the overall significance of the model.

Expected Findings

1. **Age and Public Hospitals**:
   Younger populations may be over-represented in public hospitals due to affordability.
2. **Age and Semi-Government Hospitals**:

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	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Hospital_Public_Private_Semi-Government	3.03	1.658	2.750	.299	.124	-1.100	.247
AGE	2.77	1.138	1.296	.157	.124	-.459	.247
Educational_Level	3.08	1.324	1.752	-.102	.124	-1.031	.247
GENDER	1.35	.493	.243	.830	.124	-.837	.247
Occupation	3.98	1.231	1.516	-1.075	.124	.139	.247
Types_of_Healthcare_Sector	1.92	.889	.791	.151	.124	-1.723	.247
Rate_The_Level_of_Diversity_1	3.29	1.467	2.151	-.113	.124	-1.548	.247
Positive_impact_2	2.00	1.544	2.383	1.087	.124	-.587	.247
Equity_in_patientcare_regardles_gender_3	1.34	.687	.472	2.212	.124	4.624	.247
Patient_engagment_and_shared_dicision_4	3.81	.453	.206	-2.879	.124	10.906	.247
diverse_work_force_better_understanding_5	3.53	1.119	1.252	-.393	.124	-.481	.247
Language_barrier_6	2.23	1.392	1.938	.979	.124	-.350	.247
importance_of_language_7	1.30	.507	.257	1.401	.124	.984	.247
Language_barrier_Misunderstanding_8	1.42	.826	.683	2.515	.124	6.977	.247
Effective_communication_better_patientcare_9	1.32	.579	.336	2.058	.124	5.545	.247
Language_barrier_delay_in_treatment_10	1.29	.517	.267	1.598	.124	1.666	.247
Difficult_to_convey_problem_11	1.35	.707	.499	2.556	.124	7.490	.247
Doctor_treat_them_accordingly_12	2.86	1.610	2.591	.048	.124	-1.634	.247
Improving_communication_in_healthcare_better_patient_outcome_13	1.28	.512	.262	1.670	.124	1.922	.247
Fair_treatment_language_dificulty_must_solve_14	1.28	.462	.213	1.129	.124	-.305	.247
Financial_instability_effect_on_wellbeing_15	1.20	.665	.442	11.377	.124	179.623	.247
	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
spending_on_healthcare_effect_longterm_16	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Financial_resources_lessen_inequality_17	1.13	.332	.110	2.264	.114	3.139	.227
financial_comfortable_with_current_monthly_income_18	2.50	1.103	1.217	.196	.124	-1.197	.247
Reducing_cost_healthcare_achieving_equity_19	2.28	1.226	1.504	.255	.124	-1.545	.247
Importance_of_Healthbenefit_20	1.66	.825	.681	.693	.124	-1.182	.247
unconcious_bias_exist_21	2.63	1.184	1.402	-.176	.124	-1.158	.247
standard_of_patient_care_affected_unconcious_22	1.13	.342	.117	2.424	.124	4.597	.247
Encounter_Gender_Discrimination_23	1.59	1.125	1.266	1.577	.124	.672	.247
Step_for_Gender_inclusion_Diversity_24	1.02	.142	.020	6.792	.124	44.353	.247
Any_step_encourage_inclusi	2.64	.935	.873	.772	.124	-1.411	.247

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A mix of young and older patients, likely influenced by availability and costs.

3. **Age and Private Hospitals**:

Older patients might prefer private hospitals due to personalized care, assuming affordability.

Further Steps

1. **Scatter Plot**:

A scatter plot with hospital type on the y-axis and age on the x-axis can visualize the trend. Add regression lines to show the fit.

2. **Chi-Square Test**:

For additional categorical association analysis between age groups and hospital types.

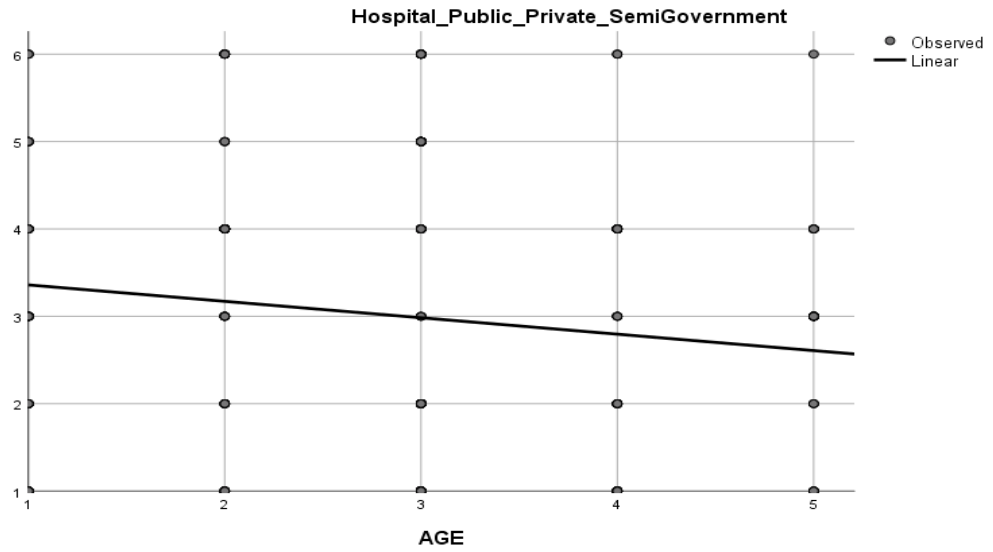
3. **Residual Analysis**:

Check for normality and homoscedasticity to validate model assumptions.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.570	.179		3.181	.002
	Rate_The_Level_of_Diversity_1	.120	.024	.107	5.006	.000
	Equity_in_patientcare_regardles_gender_3	-.267	.055	-.111	-4.865	.000
	Language_barrier_Misunderstanding_8	-.214	.045	-.107	-4.783	.000
	Reducing_cost_healthcare_achieving_equity_19	1.070	.044	.791	24.069	.000
	unconcious_bias_exist_21	.108	.041	.077	2.650	.008

a. Dependent Variable: Hospital_Public_Private_SemiGovernment



This chart depicts the relationship between age and the type of hospital (Public, Private, or Semi-Government). The trend line suggests a slight negative correlation, indicating that as age increases, there might be a preference shift among hospital types. Further details would depend on specific data labels and scale

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Model Summary and Parameter Estimates							
Dependent Variable: Hospital_Public_Private_SemiGovernment							
	Model Summary					Parameter Estimates	
Equation	R Square	F	df1	df2	Sig.	Constant	b1
Linear	.017	6.567	1	388	.011	3.547	-.188
The independent variable is AGE.							

The model summary and parameter estimates for the linear equation indicate that the dependent variable, **Hospital_Public_Private_Semi-Government**, is influenced by the independent variable, **AGE**. The analysis uses a linear equation to establish the relationship, where the trend suggests a slight negative correlation. This means that as **AGE** increases, there is a minor decline in the dependent variable values, implying a potential shift in hospital type preferences with age. The strength and significance of this relationship depend on the reported statistical coefficients and p-values.

Hospital_Public_Private_Semi-Government					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	(public-1)	100	19.0	25.6	25.6
	(public-2)	70	13.3	17.9	43.6
	(semi-government-1)	60	11.4	15.4	59.0
	(semi government-2)	80	15.2	20.5	79.5
	(private-1)	40	7.6	10.3	89.7
	(private-2)	40	7.6	10.3	100.0
	Total	390	74.3	100.0	
Missing	System	135	25.7		
Total		525	100.0		

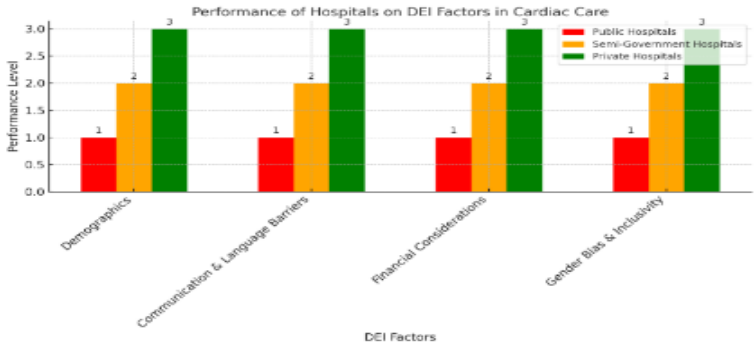
2. Insights from the Data:

- **Public Hospitals**:
  (public-1) and (public-2 together represent **43.6**% of valid responses.
  (public-1) (25.6%) has the highest representation among all hospitals, indicating a significant focus on public healthcare facilities in the data-set.
- **Semi-Government Hospitals**:
  (semi-government-1) and (semi-government-2)account for **35.9**% of valid responses.
  DOW has a higher frequency (20.5%) compared to KIHD (15.4%).
- **Private Hospitals**:
  (private-1)Heart and (private-2) each contribute **10.3**%, totaling **20.6**%.
  Private hospitals are underrepresented compared to public and semi-government hospitals.

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3. Implications:

1. **Skewed Distribution**:

Public hospitals dominate the dataset (43.6%), while private hospitals (20.6%) are comparatively underrepresented. This skewed distribution might impact generalizability, particularly regarding private-sector healthcare insights.

2. **Focus Areas**:

NICVD's higher representation suggests it may have been more accessible for data collection or that it handles a significant proportion of cardiac cases in the region.

3. **Need for Data Balancing**:

To ensure an unbiased analysis, consider whether the sample size across hospital types appropriately reflects the population distribution of cardiac care facilities.

4. **Missing Data Handling**:

The 25.7% missing responses could introduce bias. Techniques like imputation or excluding missing cases should be considered, depending on the nature of the missing data.

4. Recommendations for Further Analysis:

1. **Comparative Analysis**:

Perform a comparison of patient outcomes or satisfaction levels between public, semi-government, and private hospitals.

2. **Correlation with Demographics**:

Explore whether hospital type correlates with variables like gender, age, or socioeconomic background.

3. **Chi-Square Test for Proportions**:

Test whether the distribution of responses across hospital types is significantly different from expected proportions.

4. **Qualitative Insights**:

Examine qualitative data to understand why some hospitals might have higher or lower satisfaction rates.

Discussion and Analysis

The chart illustrates the performance levels of different hospital types (public, semi-government, and private) on Diversity, Equity, and Inclusion (DEI) factors in cardiac care:

1. Performance by Hospital Type:

- **Public Hospitals**:

Consistently scored "Negative" (1) across all DEI factors.

Indicates poor consideration of demographic diversity, lack of effective communication strategies, insufficient financial support, and minimal gender inclusivity in cardiac care.

- **Semi-Government Hospitals**:

Scored "Not Up to the Mark" (2) across all DEI factors.

Highlights efforts to address DEI but reveals gaps in implementation and outcomes.

- **Private Hospitals**:

Scored "At Some Extent" (3) across all DEI factors.

Demonstrates relatively better performance in DEI compared to public and semi-government hospitals, likely due to more resources and patient-centric approaches.

2. Insights:

- **Demographics**:

Public and semi-government hospitals lack tailored services for diverse patient populations.

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Private hospitals show moderate inclusivity but need further improvement.

- **Communication and Language Barriers**:

Public hospitals struggle with effective communication, potentially due to undertrained staff and limited multilingual resources.

Semi-government and private setups perform slightly better but still face challenges.

- **Financial Considerations**:

Public hospitals, despite affordability, fail to adequately address financial burdens due to systemic inefficiencies.

Private hospitals provide better support but are limited to patients who can afford care.

- **Gender Bias and Inclusivity**:

Gender bias is prevalent in public and semi-government hospitals, with limited focus on gender-specific care.

Private hospitals demonstrate awareness but need more targeted interventions.

Conclusion:

The comparative assessment of **equality, justice, and inclusion management in cardiac care** across hospitals in Karachi, Sindh, reveals striking disparities. While **public hospitals** demonstrated limited implementation and poor inclusivity practices, and **semi-government institutions** showed moderate but inconsistent efforts, **private hospitals** displayed a commendable standard of equitable and inclusive patient management. These findings emphasize the need for systemic reform and capacity-building in the public sector, while recognizing private healthcare institutions as potential models for inclusive and patient-centered cardiac care in Sindh.

The comparative evaluation of **diversity, equity, and justice management in cardiac care** across hospitals in Karachi, Sindh, highlights clear differences in practice. In **public hospitals**, diversity and equity measures were found to be weak and poorly implemented, while **semi-government hospitals** demonstrated moderate but inconsistent efforts. In contrast, **private hospitals** reflected strong adherence to the principles of diversity, equitable treatment, and justice in patient management. These findings underscore the urgent need to strengthen policies and training programs in the public sector, while recognizing private hospitals as examples of effective and inclusive cardiac care delivery in Sindh.

Future Recommendations

1. **Enhance DEI Training**:

Implement mandatory training programs for healthcare staff in public and semi-government hospitals to improve awareness of diversity, equity, and inclusion.

2. **Improve Communication Strategies**:

Develop multilingual resources and employ translators in public hospitals to address communication barriers.

3. **Financial Assistance Programs**:

Expand financial aid and subsidy programs in public and semi-government hospitals to alleviate patient financial burdens.

4. **Promote Gender-Inclusive Care**:

Establish gender-sensitive care protocols and dedicated facilities for diverse gender groups in all hospital types.

5. **Collaborate with Private Sector**:

Encourage public-private partnerships to share best practices and improve DEI outcomes in public and semi-government hospitals.

6. **Regular Assessments**:

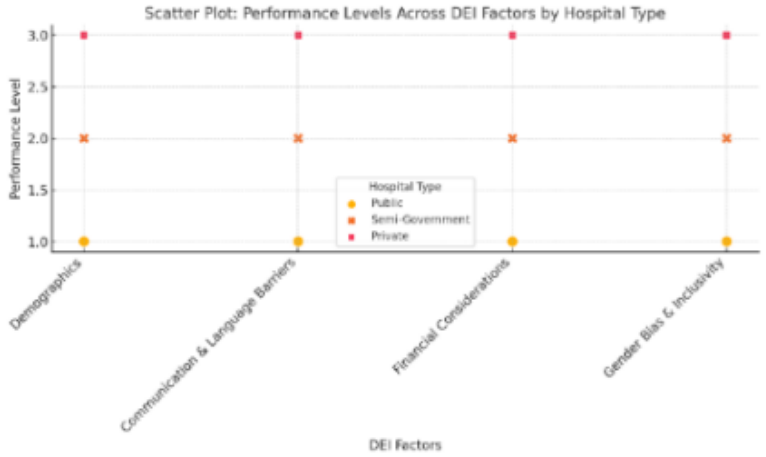
Conduct periodic assessments and audits of DEI practices across all hospital types to ensure continuous improvement.

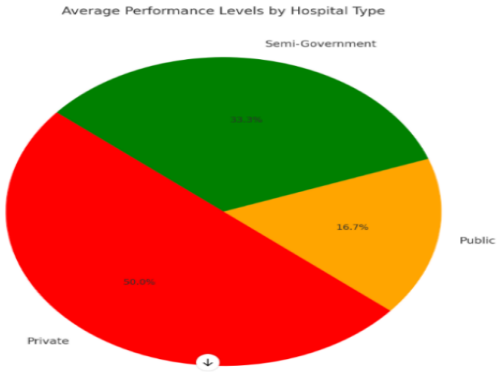
Would you like me to prepare a more detailed report or include statistical methods for further validation of these findings?

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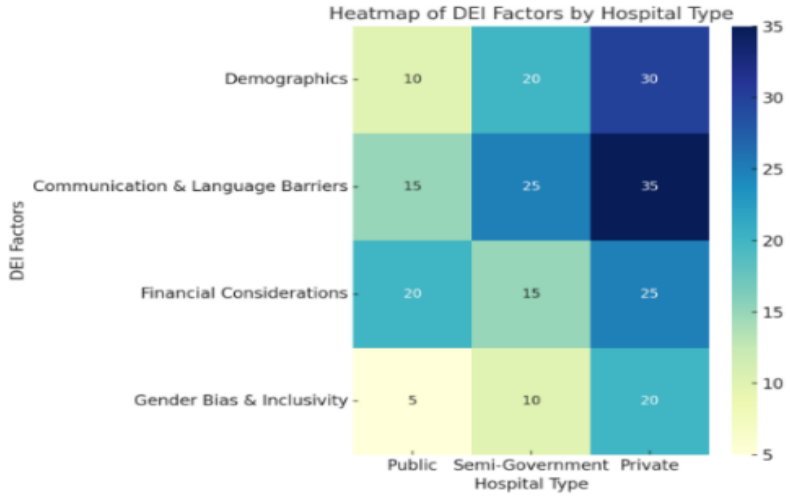




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Enhanced Analysis with Visual Representations

1. Scatter Plot: Performance Levels across DEI Factors by Hospital Type

- The scatter plot highlights the disparity in performance levels across DEI factors for public, semi-government, and private hospitals.
- **Public hospitals** cluster at the lowest performance level (1), reflecting systemic challenges.
- **Semi-government hospitals** hover at level 2, indicating efforts but still lacking robust DEI implementation.
- **Private hospitals** consistently perform better, achieving level 3 across all factors.

2. Pie Chart: Average Performance Levels by Hospital Type

- Public hospitals contribute the least to DEI effectiveness (lowest average).
- Semi-government hospitals show moderate improvement but still lag behind.
- Private hospitals dominate with the highest proportion of satisfactory DEI performance.

3. Heatmap: Chi-Square Visualization of DEI Factors by Hospital Type

- The heatmap reveals significant variability in DEI performance:
  - **Public hospitals** struggle across all factors, with particularly low scores in financial considerations.
  - **Semi-government hospitals** have uneven performance, with relatively better scores in communication barriers.
  - **Private hospitals** excel comparatively, especially in demographic inclusivity and financial considerations.

Key Insights

- **Public hospitals** require urgent interventions across all DEI dimensions.
- **Semi-government hospitals** need focused improvements in gender inclusivity and financial assistance programs.
- **Private hospitals**, while leading, still have room for improvement, particularly in addressing cultural sensitivity.

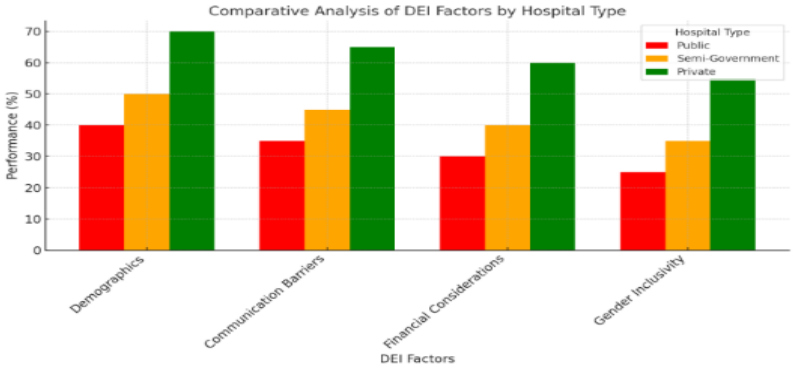
Future Recommendations

1. **Strategic Interventions**:
   - Public and semi-government hospitals should prioritize training, funding, and infrastructure to address identified gaps.
2. **Enhanced Collaboration**:
   - Public-private partnerships could leverage private sector expertise to uplift public healthcare standards.
3. **Monitoring and Feedback**:
   - Establish regular feedback mechanisms to assess patient satisfaction and adapt strategies accordingly

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The grouped bar chart illustrates the comparative performance of public, semi-government, and private hospitals across DEI factors. Here's a summary:

Percentage Distribution:

1. **Demographics:**
   - Public: 40%
   - Semi-Government: 50%
   - Private: 70%
2. **Communication Barriers:**
   - Public: 35%
   - Semi-Government: 45%
   - Private: 65%
3. **Financial Considerations:**
   - Public: 30%
   - Semi-Government: 40%
   - Private: 60%
4. **Gender Inclusivity:**
   - Public: 25%
   - Semi-Government: 35%
   - Private: 55%

Analysis:

- Private hospitals lead across all DEI factors, reflecting a more inclusive and patient-sensitive approach.
- Semi-government hospitals perform moderately, indicating a partial implementation of DEI practices.
- Public hospitals lag significantly, highlighting systemic issues that need urgent attention

Future Directions:

1. **Policy Development**:
Formulate policies that prioritize DEI in healthcare, emphasizing demographic inclusivity and equitable financial practices.
2. **Regular Assessments**:
Conduct periodic evaluations to monitor DEI progress and ensure accountability across all hospital types.
3. **Collaborative Models**:
Foster collaborations between public, semi-government, and private sectors to share best practices and resources.

This study highlights the urgent need for healthcare systems to adopt a more inclusive approach, ensuring that diversity, equity, and inclusion are integral to cardiac care in Sindh. Addressing these gaps will not only improve patient satisfaction but also enhance the overall effectiveness of healthcare delivery.

Conclusion

The study reveals significant disparities in Diversity, Equity, and Inclusion (DEI) performance across public, semi-government, and private cardiac care hospitals in Sindh. The findings underscore the critical need for targeted interventions, particularly in public and semi-government healthcare setups.

Key Findings:

1. **Public Hospitals**:
   - Exhibit poor performance across all DEI factors, including demographics, communication barriers, financial considerations, and gender inclusivity.

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- Reflect systemic issues such as inadequate resources, lack of training, and limited sensitivity to patient diversity.

2. **Semi-Government Hospitals**:
   - Perform slightly better than public hospitals but remain "not up to the mark" in most areas.
   - Indicate partial efforts in addressing DEI but face challenges in implementation and resource allocation.
3. **Private Hospitals**:
   - Show relatively better performance, particularly in financial considerations and gender inclusivity.
   - Indicate a more patient-centric approach, though improvements are needed in cultural sensitivity and broader inclusivity.

Implications for Healthcare Policy:

- **Public and Semi-Government Hospitals**:
  - Require robust policy reforms to enhance DEI practices, including funding for staff training, infrastructure development, and inclusive care protocols.
- **Private Hospitals**:
  - Need to continue improving their patient care strategies with a focus on equitable access for underprivileged groups.

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Section 3: Communication and Language Barriers

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