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Interdisciplinary Research in Biological and Medical Sciences Vol. I

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Preface

This Edited book **"Interdisciplinary Research in Biological and Medical Sciences Vol. I"** is based on the proceedings of the "Online International Conference on The Role of AI and Multidisciplinary Research in Shaping a Sustainable Future organized by Kaaf University College, Ghana (West Africa) in Collaboration with International Institute for Special Education (IISE), Lucknow & Science-Tech Institute , Lucknow, U.P. during Jan 11-13, 2024. The aim of this conference was to bring together the young as well as experienced researchers on one platform to discuss the recent findings in the aforesaid areas of Biological and Medical Sciences. The present volume is based on the contributions made by various authors on different important topic of **"Interdisciplinary Research in Biological and Medical Sciences Vol. I"** and introduces the subject along the following topics: Antifungal Activity of Nano- Encapsulated Essential Oils; Evaluation of Public Health-Care Services of District Hospital Budgam Kashmir Valley India; Evaluation of Glasgow (IMRIE) Score, CRP and Balthazar Score in Predicitng Severity of Acute Pancreatitis; Incorporation of Artificial Intelligence in Garbhasanskar to enhance cosmic impact of senses (Panchaindriya) on fetus; Effects of Selected Carbonated Beverage on Cultivated Microorganisms from Public Toilet; Government Health Expenditure as a Percentage of GDP and its Impact on Sustainable Development in Healthcare in India; Use of Artificial intelligence in the diagnosis of Oral Cancer; Novel Delivery System of Essential Oil; The Role of Artificial Intelligence in Advancing Medical Education and Research; and In Silico Identification of Potential Inhibitors of COVID-19 Protease from *Abrus Precatorius*. We must place on record our sincere gratitude to the authors not only for their effort in preparing the papers for the present volume, but also their patience in waiting to see their work in print. Finally, we are also thankful to our publishers Mrs. Shweta Singh M/S MKSES Publishers, Lucknow for taking all the efforts in bringing out this volume in short span time.

Editors

Evaluation of Public Health-Care Services of District Hospital Budgam Kashmir Valley India

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Abstract

Introduction: One of the most important public health concerns for the foreseeable future according to the WHO is disparities in access to healthcare. Therefore, it is important to design the healthcare delivery system such that it can meet the demands of the entire community. We used primary and secondary data like availability, accessibility of the selected public healthcare facility, utilization of public healthcare institution, satisfaction among in- and out-patients, satisfaction among medical professionals, nursing, and other health care professionals' and also observed nursing performance score. The present study examines how frequently people in the Kashmir division use healthcare services and how satisfied they are with it.

Methods: This study is a cross-sectional study conducted in District Budgam of Kashmir region in Northern India. The observational tool of district hospital was developed to assess the available public health services with confirmation to IPHS

norms 2012. Utilization of public health care services (performance indicators) tool was framed to assess the utilization of public health services. A structured questionnaire cum interview schedule was developed and used for data collection in particular healthcare facilities. Based on the accessibility and use of the public health services offered at the chosen hospital, the satisfaction of in-patients and out-patients was evaluated. Finally, the level of satisfaction among different healthcare experts was assessed in terms of professional growth, equipment, emergency supplies, residential facilities, staff requirements, interpersonal relationship with healthcare workers and patients, working conditions, recognition and growth.

Results: The study revealed a 25%, 33% and 20% shortage of medical and surgical specialists and nursing staff respectively, whereas paramedical staff strength was roughly in line with Indian Public Health Standards (IPHS 2012). The overall mean patient satisfaction was 67.2% indicating a high degree of contentment among patients who used this health care facility's services. The study revealed a notable discontent (49.114%) among doctors, nurses and paramedical staff, particularly regarding their job profiles, recognition for their contributions, promotional opportunities, and pay scale. The mean overall nursing performance ranged from poor to fair (2.93+0.52), indicating that while the nursing staff demonstrated a fair job in domains like professionalism, communication, and problem-solving, their performance fell below the expected standard, particularly in areas such as management and the nursing process.

Conclusion: The findings of this study underscore critical challenges within the healthcare system, particularly in the shortage of medical, surgical specialists and nursing staff. The study highlights the complex dynamics within the healthcare workforce, emphasizing the need for targeted interventions to address specialist and nursing shortages. Additionally, recognizing the satisfactory levels of employee and patient satisfaction suggests a potential avenue for building on existing strengths to enhance overall healthcare delivery and provider morale. Future efforts should focus on strategic recruitment and retention strategies for medical, surgical, specialists and

nursing staff while sustaining the positive aspects of employee and patient satisfaction observed in this study.

Keywords: *Public Health, Health-Care Services, utilization of public healthcare, Performance indicators, Availability.*

Introduction

We cannot disregard the fact that access to health care is a fundamental public right when we assert that health is a human right**(1)**. Although being a major player in developing health policies and services, India treats health as a state matter **(2)**. Thus, it means that the state's authority is accountable for the well-being of its citizens**(3)**. Also, we are aware that social, economic, political, and environmental issues affect each nation's ability to build its healthcare system since they have an impact on that nation's overall progress**(4)**. Primary, secondary and tertiary levels make up India's three-tiered system of health care services. Primary health care is given in the framework of primary health centers and health sub-centers by several qualified health workers at the primary level, which is the first point of contact between individuals, families and communities with the National Health System **(5)**. The second level of care is secondary health care, which includes community or sub-district health facilities that act as the first point of health care referral to the primary care system **(6)**. Compared to secondary care, the tertiary level is highly specialized. The district hospital serves as the tertiary level of healthcare and is a crucial part of the district health system. All of these healthcare facilities offer community members in the district curative, preventive and promotional healthcare services **(7)**.Inequalities in access to healthcare have also been identified by WHO as one of the key public health issues of the future **(8)**. So, the healthcare delivery system should be set up so that it can accommodate the needs of the entire population **(4)**.

Over the past ten years, patient’s perceptions of healthcare have gained widespread acceptance as an important indicator for gauging the quality of healthcare as well as a vital component of clinical effectiveness and performance improvement. Traditionally, the quality of health services was determined by professional practice standards **(9)**.

Since most previous studies have only used secondary sources, we wanted to use primary and secondary data to investigate how frequently individuals in the Kashmir division use healthcare services in particular District Hospital Budgam and how satisfied they are with it.

Methods

This study is retrospective, cross-sectional, multistage, quantative-method conducted in District Hospital Budgam of Kashmir region in northern India.

The study was a survey and interview-based conducted to assess the:

a) Availability of the selected public healthcare facilities
b) Utilization of selected public healthcare facilities
c) Satisfaction among in-patients and out-patients
d) Satisfaction among healthcare professionals
e) Performance levels of nursing professionals

The availability of specific healthcare services in the District Hospital Budgam of Kashmir Valley, which is one of the Districts of Central Kashmir, is covered in the study's first section. The observational availability tool of district hospital was developed to assess the available public health services with confirmation to IPHS norms 2012 and selected utilization of public health care services (performance indicators) tool was framed to assess the utilization of public health services. A structured questionnaire cum interview schedule was developed and used for data collection in particular healthcare facility. Based on the accessibility and use of the public health services offered at the chosen hospital, the satisfaction of in-patients and out-patients was evaluated **(10)**. Finally, the level of satisfaction among different healthcare experts was assessed in terms of professional growth, equipment, emergency supplies, residential facilities, staff requirements, interpersonal relationship with healthcare workers and patients, working conditions, recognition and growth.

Sample size and data collection

The study was carried out between Feb 2022 to April 2022. Based on previous studies of patient satisfaction and quality of care, using an appropriate statistical formula for estimating minimum sample size in descriptive health studies [$n=Z^2pq/d^2$], a prevalence sample size of 384 ± 39 was used to detect the level of satisfaction among the patients and employees. The estimate of 50% was used for the calculation of the sample size. The sample size was inflated by 10% to take care of non-responses, incomplete responses and refusals. Since this is a part of bigger study which will be conducted in District hospital of Kashmir, a sample of **110** was taken for pilot study from this district, with additional 9 for attrition (**110+9=119**).

The second stage involved a satisfaction assessment of the patients and hospital employees. Based on the number of employees at the District Hospital, a sample size of participants was determined on the bases of consecutive sampling. Many facets of hospital treatment were examined using a structured questionnaire cum interview schedule. The tool, which was developed based on a literature review and in-depth interviews with hospital patients, contained questions. It included inquiries about the respondent's socio-demographic details. Items on the survey used the Likert scale with scores ranging from 1 to 5, representing the lowest to highest levels of satisfaction. No identities were written down on the questionnaire in order to guarantee complete secrecy. Before starting the survey, prior ethical board clearance was acquired. Permission from Directorate health services Kashmir was also sought. Interviews with inpatients and employees were taken in the wards while those with outpatients were taken when they left the clinics.

Statistical analysis

The surveyed questionnaires were collected and coded in an MS Excel database and analyzed by using the SPSS statistical package, version 26.0. Descriptive statistics was performed on the socio-demographic data, the behavior of doctors and other employees, satisfaction with clinical services and satisfaction with pharmacy services and others.

Results and Discussion

The district of Budgam, which is 1,371 square feet in area and 5,281 feet above sea level, has an average elevation of 1,371 feet. Three tehsils make up district Budgam: Budgam, Chadoora, and Beerwah. The district has 10 medical facilities. The district capital is located at Budgam. The city has a population of 753,745 (2011Census), a decadal growth rate of 26.5 percent, and a gender ratio of 910 women per 1,000 men. 56.08% population is literate. 86% of Budgam's population dwells in the villages and is predominantly involved in agricultural activities. The District Hospital Budgam is a **100**-bedded hospital.

Physical Infrastructure

The Area of the Hospital is **1345** (in hectares) and is not NABH (National Accreditation Board for Hospitals and Healthcare Providers) certified. The hospital is located near a residential area which is generally free from noise, water, air and land pollution. The necessary environmental clearance certificate has been obtained by the Administration.

Building Status: The present stage of construction of the building is complete with partial fencing and the plaster on walls coming off in some places but the condition of the floor is good.

Building Requirements with confirmation to IPHS-2012: The hospital had a separate administrative block. The entrance area was clear with Ambulatory Care Area (OPD) but no waiting spaces adjacent to each consultation and treatment room. The registration and enquiry counters had no assistance for the patients and had no citizen charter. The signage directions (Arrows) were well-placed. The hospital housed the departments / OPD clinics of Medical, Surgical, Ophthalmic, ENT, Dental, Psychiatry, Obstetric & Gynecologist and Pediatrics and lacked other important services like Family Planning, Neonatology (immunization), Dermatology & Venereology. Moreover, the hospital had a well maintained delivery Room/labor Room in addition to separate sections for orthopedic and AYUSH services. Also, the hospital housed a de- addiction and counseling section and also provided physiotherapy services to the

patients. However, no nursing, geriatric, integrated counseling and testing center, hospital infection control section, and public health sections could be seen in the hospital.

Diagnostic Services Area: The hospital had well equipped radiology services like X-Ray, Ultrasound, ECG, and Endoscopy in accordance with the **IPHS** 2012 guidelines **(11)** but lacked other high end diagnostic facilities like CT scans for which patients were being shifted to other tertiary care Hospitals. Also the hospital housed a well- furnished and equipped Clinical Laboratory and Blood bank facility.

Pharmacy (Dispensary) Area: The hospital had a separate pharmacy and medical store with accessibility for the OPD patients but there were no separate public utilities for males and females and no suggestion/complaint box on the hospital premises.

Operation Theatre: Although the hospital had a functional operation theatre but its location was far from the departments of Radiology and Blood Bank. Moreover, the hospital lacked an Intensive Care Unit (ICU) & High Dependency Wards.

Ancillary and supportive services area: The hospital had no separate kitchen (Dietary Service), Central Sterile and Supply Department (CSSD), Hospital Laundry and General Stores. The Mortuary along with Medico-legal/Post-mortem room was present. Separate water/electricity maintenance room/section was present but lacked drainage and sanitation supervisor room. The Ambulance services/driver area and maintenance and repair room was present but a proper waste disposal system or sewerage staff room could not be located.

Administrative services: Although administrative services are being provided, there was no separate finance section, medical records section, procurement section, personnel section, housekeeping and sanitation department, educational and training department, inventory management department, management information system, and grievance redressed services.

Epidemic control & disaster preparedness area/section: There was no integrated disease surveillance (IDSP) facility and Epidemic investigation and emergency response space.

Intermediate Care Area (Inpatient Nursing Units): The general wards facility was present without separate nursing station.

Manpower: The total manpower of the District hospital Budgam is 163 of whom 41 were doctors, 35 were nurses 86 comprised of the paramedical staff and others. We observed a shortage of medical specialists by around 25%, surgical specialists by 33% and there was deficiency of the nursing staff by 20%. However, paramedical staff strength was roughly in line with Indian Public Health Standards (IPHS 2012).These finding are consistent with the Minutha. V who conducted similar study by using same tool for accessibility of Public Healthcare Services in Krishna Rajendra District Hospital, which is a tertiary referral centre and cater to the people living in urban as well as rural people in the Mysore District. Other than the shortfall of physical infrastructure, the author reported a significant scarcity of health workforce among the study area against the norms prescribed by the government **(12)**. Another study conducted by Boro & Saikia within the Bodo and Rabha tribes in Udalguri and Baksa districts of Assam reported a scenario similar to ours. The study highlighted that a shortage of human resources, including doctors, nurses, and paramedical staff, led to patient overload and an overwhelming burden on the existing staff due to the high number of patients **(13)**.

Selected Utilization of Public-Health Services (Performance indicators)

The utilization of public-health services was assessed by comparing the record-based/ secondary data of the last six years (2016 to 2021) from the administrative department of the District hospital Budgam according to the following domains.

1. In General administration, the productivity component has shown good progress. The IPD and OPD per 1000 population have shown an increased trend except in

2021 (COVID-19). The average length of stay of IPD patients has increased from 1.2 days (2016) to 1.7 days in 2021. The Hospital-acquired infection rate has declined over the period and in the Service Quality Indicator Patient/ Staff satisfaction, an increasing trend has been recorded.

2. In the Accident and emergency domain, the productivity component has also shown improvement during these six years. The number of Emergency cases per 1000 admissions, the number of trips per ambulance and the number of obstetric cases treated per 1000 emergency cases has shown an increasing trend reflecting improvement in the health care delivery system in the hospital.
3. The Blood Bank productivity has also shown improvement in terms of the number of blood units issued per thousand populations (0.18 to 0.28) and the percentage of units issued for the transfusion at the facility (39.0 -41.4) except in 2021.
4. Radio diagnosis department has also shown improved productivity in terms of three (12.27 to31.81) and two-fold (66.04 to 151.53) increase in USG and in dental X-ray per 100 dental OPD patients in 2021as compared to 2016.
5. The number of HIV and VDRL tests per thousand populations has increased by more than 2.5 times (11.53 to27.18) and (5.45 to 12.17) respectively in 2021 as compared to 2016. Similar trends were seen in other tests like hemoglobin estimation and Blood smears, etc.
6. Operation theatre activities have also increased over six years. The proportion of elective Cesarean sections has increased from 2016 to 2021.
7. In indoor patient activities, bed occupancy has increased in both surgical and medical wards, (4.1 to 4.2) and (5.1 to 6.1) respectively. The referral cases have decreased constantly in the last six years (from 117 to 84). Drug availability has improved and patient satisfaction has improved as per records (72 to 95).
8. In outdoor patient activities, the proportion of follow up patients and efficacy in their management has increased (from 2 to 6.2%) in almost all wards of the departments consistently in the last six years especially in the surgical OPD which has seen a two times increase. However, data in some streams was not available to

the hospital authorities. The dental OPD per doctor per year has decreased (from 6904 to 5682) due to the availability of more dental doctors in the institution.

The observation closely aligns with the results of a study conducted by Soumitra Ghosh, 2014, who reported a slightly higher outpatient care rate of 9% in urban areas compared to 7% in rural areas at the national level (P< 0.01) **(14)**.Additionally, the management of outdoor patients at the District Hospital Budgam was comparatively more effective than in other hospitals both across and within states, with Bihar (4.42%), Rajasthan (5.40%), and Karnataka (5.01%) exhibiting among the lowest rates. However, several other states outperformed our outdoor patient management, with Kerala (22%) leading the list, followed by Punjab (12%), and West Bengal (10%) **(14)**.

The MCH service component in the present study has also shown improvement. The number of normal deliveries has increased marginally from 597 in 2016 to 671 in 2021but at the same time; a considerable 2-fold increase in C-section deliveries from 623 to 1264 over these six years has also been noted **[Table-I] (Fig-1).** The escalating rate of C-sections is predominantly attributed to the rise in institutional births and other contributing factors such as unregulated health facilities, particularly in private institutions, coupled with a growing preference among women for this method. The prevalence of C-sections has become increasingly common in developing nations, mirroring a longstanding trend in developed countries. Notably, in India, the C-section rates have surpassed the WHO threshold of 15%, posing a significant public health challenge **(15)**.Similar improved trend in special newborn care has been observed which has increased from 112 in 2016 to 250 in 2021 **[Table-I] (Figure 1).** This improvement is mainly attributed to enhanced access to facility-based neonatal care (FBNC).

Patient Satisfaction

50 participants (patients) were interviewed, out of these 9 (18%) were male and 41 (82%) were females. The mean age with a standard deviation of the participants was

40.12 + 11.86 years, with a minimum age of 20 years and a maximum of 70 years. The socio-demographic profile of the participants is shown in **[Table 2].**

The quantitative part of the patient satisfaction was done using the five-point Likert scale (which is considered an interval scale) analysis. The mean is very significant and conventionally the inference is made as per the following cut-offs:

1.	**1.00-1.80**	**(Strongly Disagree)**
2.	**1.81-2.60**	**(Disagree)**
3.	**2.61-3.40**	**(Neutral)**
4.	**3.41-4.20**	**(Agree)**
5.	**4.21-5.00**	**(Strongly Agree)**

The mean score +standard deviation of overall patient satisfaction on statements for the degree of agreement with domains like hospital facility location, physical conditions and facilities, privacy, triage, doctors' attitude, health technicians and lack of any type of staff was assessed individually as per questionnaire. The mean + SD of all domains of patient satisfaction score was calculated as shown in **[Table 3], (Figure 2)** with the inference that all the patients were equivocal regarding cumulative satisfaction with services/ facilities and hospital. In a similar study, Aanchal et al., reported a high degree of contentment among patients who used this tertiary care facility's services **(16)**. Another study by Shuja et al., reported 79.3%overall satisfaction of patientswith services obtained from a Tertiary Care hospital in Rural Haryana **(9)**. Moreover, 80% patient satisfaction in tertiary care hospital in Kashmir was reported by Deva et al, in 2018 **(17)**. The satisfaction seemed to be high because the ideal way of analysing the Likert scale score was not used which led to overall bias in interpretation **(12;14).**

Employee Satisfaction

34 participants (employees) including 05 (14.7%) male and 29 (85.3%) females were interviewed after obtaining a proper consent. The mean age + standard deviation of the

participants was 37.21 + 08.02 years, with a minimum age of 25 years and maximum of 55 years. The study participants were mostly from urban areas 61.8% and 38.2% were from rural areas. Most of the participants were doctors (52.9 %), followed by nurses (41.2%) and 5.9% were paramedics. The educational status of the participants. The average income of the study participants who agreed to take part in the study was Rs.47323 + 22962 with Rs.15000 as a minimum and Rs.90000 as maximum. Most of the participants were married (82.4%), followed by unmarried (14.7%) and 2.9 % were Divorced/ Separated.

The quantitative assessment of the employee satisfaction was again done using the five-point Likert scale which resulted in a mean satisfaction score of 2.16 ± 0.57 and an average satisfaction level of 49.114% indicating overall dissatisfaction **[Table 4] (Fig-3)**. The data revealed a notable discontent among participants, particularly regarding their job profiles, recognition for their contributions, promotional opportunities, and pay scale. A significant contributing factor to this dissatisfaction was the majority of staff being engaged under the National Health Mission (NHM) scheme. Salaries under this scheme were perceived as relatively low compared to those of regular government and private sector employees. Additionally, employees expressed concerns about limited avenues for skill enhancement, career progression, and professional development. The perceived lack of autonomy and decision-making authority further added to their dissatisfaction. In a comparable investigation conducted by Sharma et al., the findings revealed a considerable 74% dissatisfaction rate among physicians **(18)**. Similarly, a study conducted by Kaur et al., at a tertiary hospital in Delhi reported a noteworthy percentage of doctors expressing dissatisfaction with both their average work hours and salary. Furthermore, the study highlighted that a substantial number of employees were dissatisfied with their working environment **(19)**.

In a separate cross-sectional study conducted by Wali et al. in 2023 to evaluate job satisfaction among 77 nurses in King Abdul Aziz Medical City primary health care centers, the findings revealed that 58% of nurses expressed job satisfaction, while 42%

reported dissatisfaction. Notably, around half of the participants expressed dissatisfaction with their salary (49%), working hours (47%), and prospects for future promotion (44%). Additionally, 51% of nurses attributed significant pressure to staff shortages, and 44% identified workload as a contributing factor **(20)**.

Nursing Observational

The performance of the nursing was assessed using the **Nursing Performance Observational Tool and a Score of 1 = Poor; 2 = Fair; 3 = Good; 4 = Very Good; 5 = Excellent was given** after using a five-point Likert's scale in 35 participants comprised of 22.9% males and 77.1% females. The mean age of the participants was 33.31 + 08.15 years (range 24-55 years). The study participants were mostly from rural areas 65.7% and 34.3% were from urban areas. Most of the participants were married (80%) and (14%) were unmarried.

The mean score of overall nursing performance was **2.93**+**0.52** which indicates poor to fair performance, although in some domains like professionalism, communication and problem solving the said staff were doing a fair job. However, in areas like management and, notably, the nursing process, the performance of the hospital's nursing staff was observed to be below the expected standard **[Table 5], (Fig-4)**. In the current study, the observed poor nursing performance, particularly in relation to the nursing process, may stem from inadequate training and education in this methodology. When nurses lack sufficient training in the application of the nursing process, it hampers their ability to plan and implement effective patient care. Contributing to this issue are nursing staff shortages and heavy workloads, which limit the time available for comprehensive assessments and proper care planning. Furthermore, nurses' effectiveness in adhering to the nursing process may be compromised by a lack of autonomy and decision-making authority. The absence of these elements can hinder the seamless application of the nursing process. Additionally, the insufficient availability of resources, encompassing medical equipment, technology, and support staff, poses challenges to the successful implementation of the nursing process. Lastly, inadequate documentation practices may

further exacerbate the situation. A good work environment, regular supervision and salary per regional minimum wage and non-financial rewards can improve nurses ability and motivation to perform their duties better. In a study similar to ours conducted by James et al., the authors showed a positive impact of financial and non-financial rewards on the performance of health workers **(21)**. Numerous global studies have consistently demonstrated a significant and positive correlation between rewards and the motivation of nurses at work **(21-23)**. Notably, among independent variables, payment emerges as the most influential factor impacting nurse work motivation. This conclusion aligns with similar findings in the literature, such as those by Cashman and Gray, who identified nurses' desire for improved monetary compensation as a key driver for enhanced work motivation **(22, 23)**. The importance of adequate payment as a crucial component among extrinsic rewards for nurses was also underscored by Chris & Awobnusi in 2004 **(24)**. Further support for these observations comes from research conducted in Ghana, where low salaries were identified as the primary source of dissatisfaction among health workers **(25)**. This collective evidence underscores the universal significance of payment and monetary compensation in influencing nurse work motivation across diverse geographical and cultural contexts.

Conclusion

Patient satisfaction, measured through a Likert scale, indicates a generally equivocal stance among participants. Although satisfaction levels are not explicitly high, comparisons with other studies highlight the need for nuanced interpretation. Employee satisfaction, particularly among doctors, nurses, and paramedics, reveals dissatisfaction with their job profiles. A comparison with studies in other healthcare settings adds context to these findings. Nursing performance, evaluated through the Nursing Performance Observational Tool, exposes areas of improvement, particularly in communication, and management. This highlights the importance of addressing systemic issues to enhance overall performance.

In conclusion, the study offers a comprehensive evaluation of public health services, patient and employee satisfaction, and nursing performance at District Hospital

Budgam. While positive trends are evident, the identified deficiencies in specialist and nurses availability, certain aspects of nursing performance, and the need for continuous improvement in patient and employee satisfaction underscore the importance of targeted interventions and ongoing monitoring.

Recommendations:

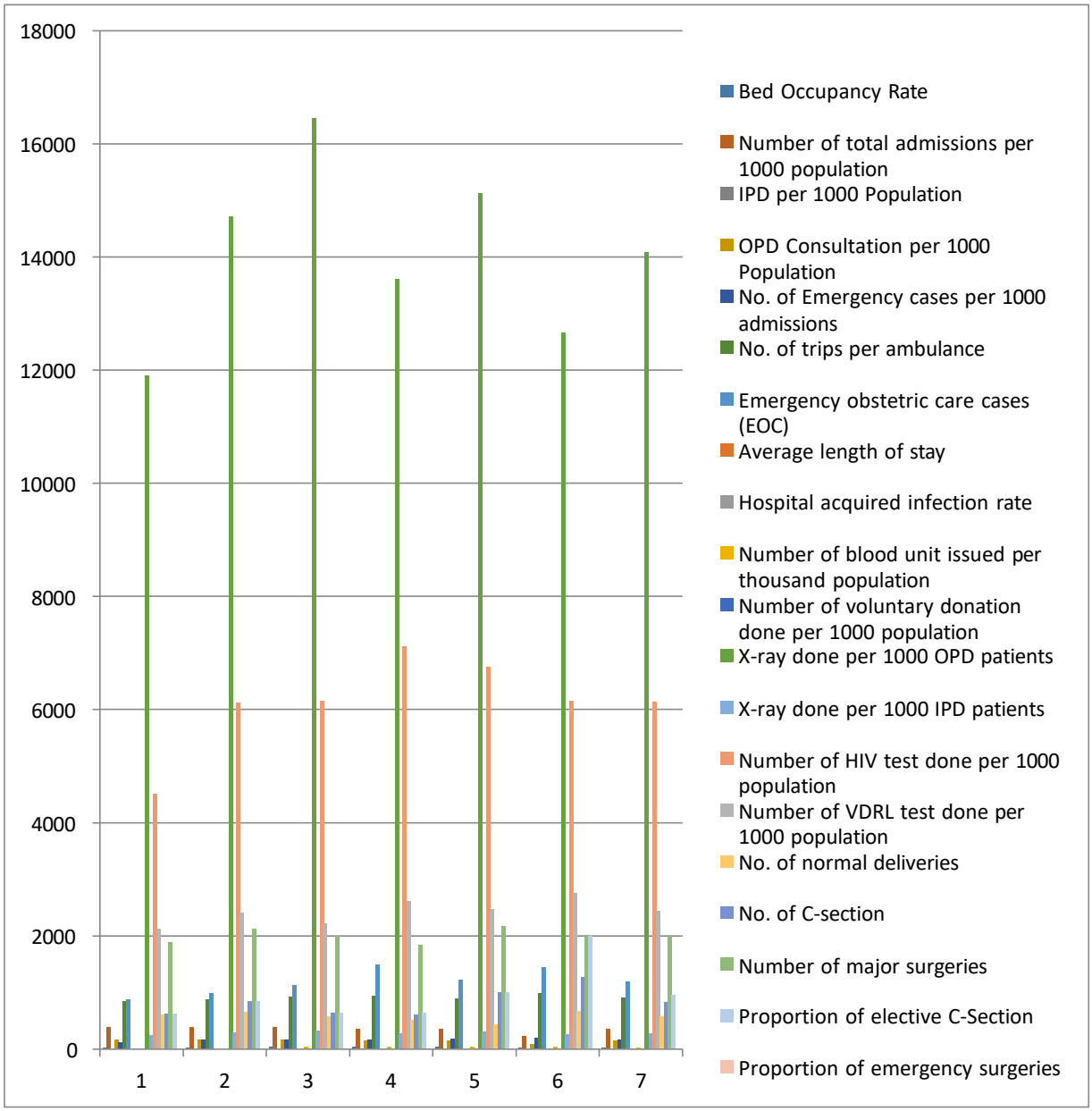
1. Workforce Strengthening:
    - Implement targeted recruitment strategies to address the 25%, 33% and 20% shortages in medical, surgical specialists and nursing staff respectively.
    - Establish incentives, professional development programs, and competitive compensation packages to attract and retain specialized healthcare professionals.
2. Nursing Performance Enhancement:
    - Develop comprehensive training programs focusing on nursing processes and management to address observed deficiencies in nursing performance.
    - Encourage regular attendance at Continuing Medical Education (CME) programs to keep nursing staff updated on the latest healthcare practices and protocols.
3. Patient Satisfaction Improvement:
    - Conduct detailed surveys and qualitative assessments to identify specific areas of concern for patients and work on targeted improvements.
    - Implement patient feedback mechanisms and establish regular forums for communication between healthcare providers and patients to address concerns and improve satisfaction.
4. Employee Engagement and Well-being:
    - Initiate employee engagement programs to understand the concerns and needs of healthcare staff, fostering a positive work environment.
    - Address specific issues raised in employee satisfaction surveys, such as salary concerns, working hours, and opportunities for career advancement.

By implementing these recommendations, District Hospital Budgam can enhance its healthcare services, address workforce deficiencies, and improve overall patient and employee satisfaction, contributing to a more robust and responsive healthcare system. Conflict of interest statement: The authors declare that they have no competing Interests.

Table-I: Performance Indicators of District HospitalBudgam:For Assessing the Utilization ofSelected Public-Health Services in Retrospective Manner (2016- 2021)

S. No	Items	2016	2017	2018	2019	2020	2021	Average
a	Bed Occupancy Rate	27.01	28.30	33.26	30.97	35.06	27.54	**30.35667**
b	Number of total admissions per 1000 population	390.89	388.01	385.26	351.86	359.33	226.45	**350.3**
c	IPD per 1000 Population	11.23	11.29	13.11	12.06	13.47	10.45	**11.935**
d	OPD Consultation per 1000 Population	156.36	155.20	154.11	140.74	143.73	90.58	**140.12**
e	No. of Emergency cases per 1000 admissions	123	165	170	173	179	189	**166.5**
f.	No. of trips per ambulance	834	867	921	945	890	995	**908.6667**
g	Emergency obstetric care cases (EOC)	873	987	1132	1491	1234	1456	**1195.5**
h	Average length of stay	1.2 days	1.2 days	1.4 days	1.3 days	1.4 days	1.7 days	**1.366667 Days**
i.	Hospital acquired infection rate	0.07	0.06	0.05	0.04	0.02	0.02	**0.043333**
j.	Number of blood unit issued per thousand population	0	0	39	43	40.4	41.8	**27.36667**

k	Number of voluntary donation done per 1000 population	0	0	0.23	0.31	0.26	0.28	**0.18**
l.	X-ray done per 1000 OPD patients	11901	14713	16459	13613	15132	12665	**14080.5**
m	X-ray done per 1000 IPD patients	238	294	329	272	303	253	**281.5**
n	Number of HIV test done per 1000 population	4512	6122	6145	7122	6752	6156	**6134.833**
o	Number of VDRL test done per 1000 population	2134	2412	2212	2625	2466	2756	**2434.167**
p	No. of normal deliveries	597	658	575	512	437	671	**575**
q	No. of C-section	623	847	635	603	1005	1264	**829.5**
r.	Number of major surgeries	1898	2124	1999	1842	2173	2012	**2008**
s.	Proportion of elective C-Section	623	847	635	637	1005	1995	**957**
t.	Proportion of emergency surgeries	0.01	0.01	0.01	0.01	0.01	0.02	**0.011667**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2
3
4
5
6
7
Bed Occupancy Rate
Number of total admissions per 1000 population
IPD per 1000 Population
OPD Consultation per 1000 Population
No. of Emergency cases per 1000 admissions
No. of trips per ambulance
Emergency obstetric care cases (EOC)
Average length of stay
Hospital acquired infection rate
Number of blood unit issued per thousand population
Number of voluntary donation done per 1000 population
X-ray done per 1000 OPD patients
X-ray done per 1000 IPD patients
Number of HIV test done per 1000 population
Number of VDRL test done per 1000 population
No. of normal deliveries
No. of C-section
Number of major surgeries
Proportion of elective C-Section
Proportion of emergency surgeries

Figure 1

Table 2: Sociodemographic characteristics of Participants

Socio-demographic Variables		N (%)
Gender	Male	9(18)
	Female	41(82)
Age	40.12 + 11.86 (20 - 70 years).	
Educational Status	Middle School	11 (22)
	Higher Secondary	7 (14)
	Graduate	21(42)
	Post Graduate	11(22)
Marital Status	Married	40(80)
	Unmarried	7(14)
	Separated	1(2)
	Widow	2(4)
Income	15000	3(6)
	35000	21(42)
	50000	12(24)
	70000	8(16)
	90000	6(12)

Table 3: Distribution of Mean Satisfaction level of Patient

S No.	Overall Patient satisfaction	Mean+ (SD)	Inference	Mean Satisfaction level (%)
1	Hospital facility location	2.93+ (0.35)	Neutral	58.6%
2	Facilities and physical conditions	2.99+ (0.43)	Neutral	59.8%
3	Privacy	3.54+ (0.46)	Agree	70.8%
4	Triage	3.56+ (0.41)	Agree	71.2%
5	Doctors Attitude	3.42+ (0.40)	Agree	68.4%
6	Health technicians	3.54+ (0.39)	Agree	70.8%
7	Lack of any type of staff	3.53+ (0.30)	Agree	70.6%
Cumulative		**3.36 + 0.39**	**Neutral to Agree**	**67.2%**

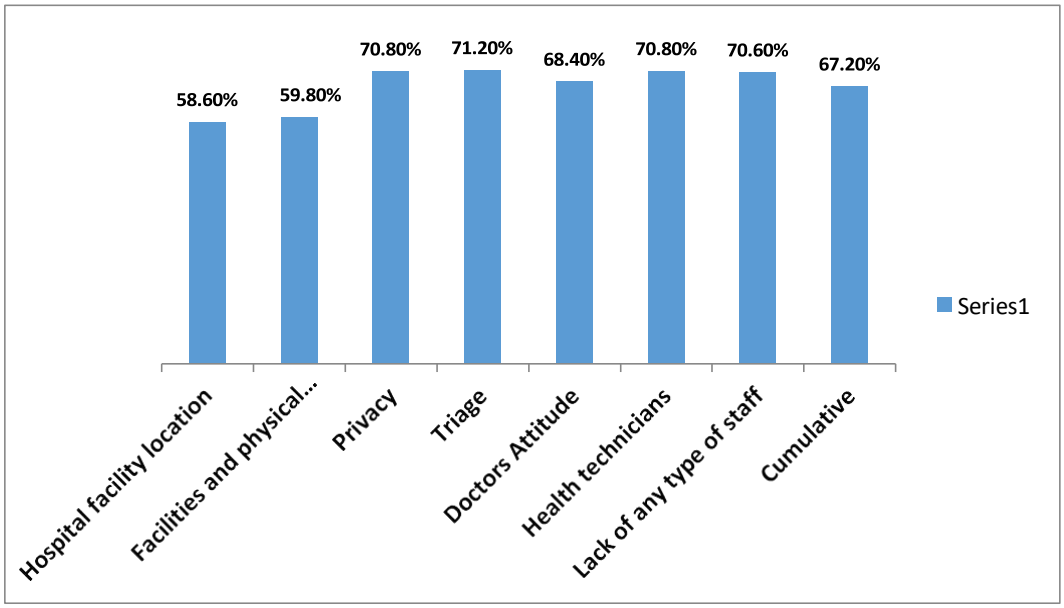

Figure 2: Distribution of Mean Satisfaction level of Patient

Table 4: Distribution of Mean Satisfaction level of Employees

Overall Employees satisfaction	**Mean+SD**	**Inference**	**Mean Satisfaction level (%)**
Job Satisfaction	2.12 + 0.33	Disagree	45.4%
Autonomy	2.68 + 1.01	Neutral	53.6%
Co-work	3.66 + 0.46	Agree	71.2%
Recognition of work	1.94 + 0.81	Disagree	43.8%
Promotion	1.85 + 1.10	Disagree	41.0%
Supervision	2.46 + 0.76	Neutral	49.2%
Pay	1.73 + 1.01	Disagree	38.6%
Overall Satisfaction of Employees (Cumulative)	**2.76 + 0.57**	**Disagree**	**49.114%**

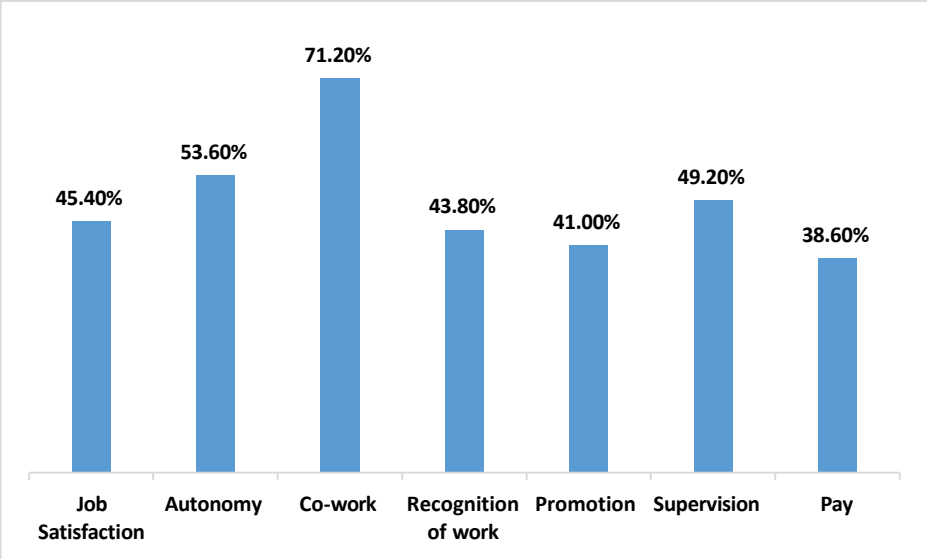

Figure3: Distribution of Mean Satisfaction level of Employees

Table 5: Mean with SD of Overall Nursing Performance

Nursing Performance	Mean+SD	Inference
Professionalism	**3.12+0.63**	**Fair**
Communication	**3.42+0.46**	**Fair**
Management	**2.32+0.76**	**Poor fair**
Nursing Process	**2.45+1.05**	**Poor**
Problem solving	**3.36+0.52**	**Fair**
Overall Nursing Performance	**2.93+0.52**	**Poor to Fair**

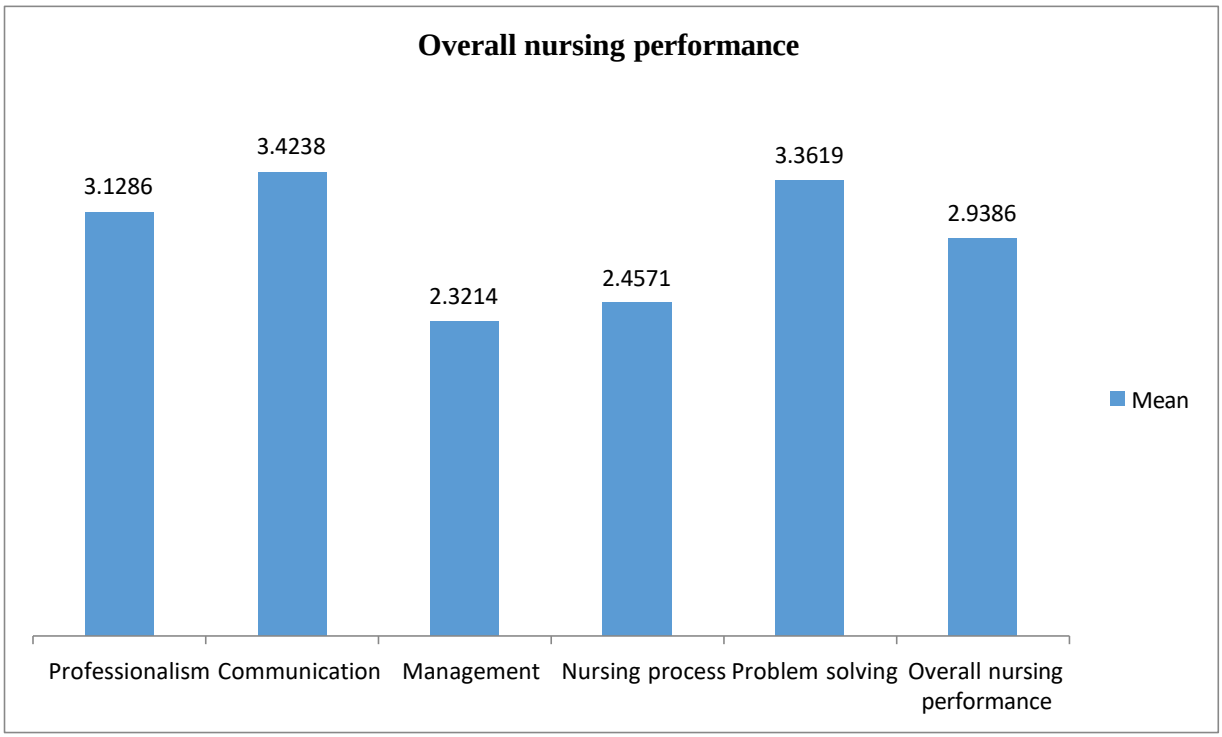

Fig 4: Mean with SD of Overall Nursing Performance

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