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RESEARCH ARTICLE

EXPERIENCE OF ONE STOP "FLU OPD" BASED COVID CARE MODEL IN A TERTIARY HOSPITAL OF WESTERN UTTAR PRADESH: AMBI-SPECTIVE STUDY

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Abstract

Background: Following the initial confirmation of India's first case on January 2020,a systematic screening facility for SARS-CoV-2 infection was established in accordance with the guidelines at every hospital. Subsequently, in light of the emergence of variants such as Omicron, this facility was enhanced to function as an integrated 'one-stop' center for comprehensive screening, diagnostic testing, and therapeutic intervention. This study seeks to evaluate both the demographic profile of patients and the operational efficacy of the "Flu OPD" at GIMS.

Materials and Methods: All the patients visiting Flu OPD form 1st January 2022 to 31st March 2022 were line listed and a random convenience sample of 147 patients were included in the study for this questionnaire-based descriptive study.The analysis of sociodemographic variables and variables related to COVID-19 screening services was expressed using descriptive statistics like mean, median, proportion and relevant graphical presentation.

Results: During the 90-day observational study period (1st January–31st March 2022), a total of 147 patients were assessed at the FLU Outpatient Department (OPD). The mean age was 35.8 years; the majority (57.14%) were male and resided within the 15–59 age demographic (85.7%). The predominant symptoms exhibited were cough (97.9%) and fever (95.9%). Approximately 15% of the patients presented with risk factors history of SARS-CoV-2 infection, recent travel/contact), categorizing them as 'suspects. SARS-CoV-2 testing was conducted within a 30-minute timeframe for 72% of the patients, whereas admission processes were finalized within 15 minutes for 66% participants. More than 90% of the patients expressed satisfaction with the services provided by the Flu OPD.

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Conclusion: This study demonstrated that 'one stop' COVID care model in the form of Flu OPD was an effective management strategy against the public health challenges like COVID-19 especially in resource constrained countries to optimally utilize the manpower and resources in combating the pandemic at large. However, no single strategy is ideal for every setting or every time, the health system must adhere to a holistic and locally relevant approach in dealing with such situation in future.

Introduction:-

At the end of 2019, a novel coronavirus rapidly spread throughout the world, resulting in a global pandemic. The virus was designated severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the illness it caused coronavirus disease 2019 (COVID-19). The spectrum of COVID-19 in adults ranges from asymptomatic infection to mild respiratory tract symptoms to severe pneumonia with acute respiratory distress syndrome (ARDS) and multiorgan dysfunction. Our understanding of the spectrum of disease as well as optimal management strategies continues to evolve, particularly with the emergence of SARS-CoV-2 variants.

The World Health Organization declared the COVID-19 outbreak as a pandemic on 11th March 2020. On 30th January 2020, the first confirmed case of COVID-19 was detected in India.[1] With the rising number of cases, the need to screen all patients with respiratory symptoms and travel history was recognised. One effective strategy was the establishment of COVID-19 screening centres. Such centres as fever clinics, cough OPD, Flu OPD, COVID clinics were established to screen the patients based on the standard criterion which was updated time and again as per ICMR guidelines.

At the screening centres, prompt screening and specimen collection are important, but the safety of medical staffs and testees is the top priority. Cross-contamination should also be minimized during the specimen collection process. With increasing instances of nosocomial outbreaks of COVID-19, it has become even more important to screen all patients with suspected infectious disease in the hospital setting as well as for control and prevention of infection in the community.[2]

The Ministry of Health and Family Welfare (MOHFW), India issued guidelines for setting up COVID-19 screening centres in healthcare settings. The purposes of these screening centres were to (a) attend to patients of inFluenza-like illness in a separate area from the general outpatient department (OPD), (b) to facilitate implementing standard droplet precautions, (c) to triage the patients and (d) collect samples.[3] Based on these principles, healthcare institutions have developed and implemented a hospital-specific systematic process for screening and managing suspected COVID-19 patients.[4,5]

However, till now there is limited published literature regarding the functioning and patient profile of these COVID-19 screening facilities, especially at tertiary care institutions which are significantly involved in both COVID-19 and non-COVID-19 services simultaneously.[6]

The Government Institute of Medical Sciences (GIMS) Greater Noida, Gautam Buddha Nagar, is an autonomous medical teaching institute established by the State Government of Uttar Pradesh on the 15th of February, 2016. It is a 500-bedded tertiary care institution that caters to a population of 2.2 million of the district. The "Flu OPD" was established and made functional on 2nd April 2020, with the main objective of screening and testing suspected COVID-19 patients before entry or admission to the hospital.

On November 24, 2021, a new SARS-CoV-2 variant has been reported to the WHO from South Africa. The new variant (B.1.1.529) has been officially named Omicron (the fifteenth Greek alphabet), as a variant of concern with potential of increase transmissibility and less virulence compared to previous variants.[7]With the emergence of new COVID-19 variants like Omicron, the functioning of "FLU OPD" was modified to a hospital-specific one stop screening, testing and treatment centre. Hence, we planned this study to understand the socio-demographic variables of the patient profile and functioning of COVID-19 screening centre "Flu OPD" at GIMS, Greater Noida, Uttar Pradesh in order to improve the healthcare services in times of pandemic.

Methods:-

Study Design and Setting:

This was a hospital based descriptive study reporting the experience of establishing a Flu OPD, its functionality and the services delivered. The study was conducted in COVID-19 screening out-patient department i.e. "Flu OPD" at

the Government Institute of Medical Sciences (GIMS), Greater Noida, Uttar Pradesh. GIMS is a 500 bedded tertiary care teaching hospital located in Greater Noida, near Kasna in Gautam Buddha Nagar and caters to the districts of Gautam Buddha Nagar, Hapur, Bulandshehar, Khurja, Jewar, Mathura and neighbouring areas of Western Uttar Pradesh.

Screening Case Definition:
All the patients visiting the hospital were classified into "Suspect" and "Not-a-suspect" case for SARS-CoV-2 infection based on travel history (in the last 14 days), contact history (in the last 14 days) and relevant symptoms suggestive of COVID-19 (fever, sore throat, cough and shortness of breath).

Description of "Flu OPD":
At the hospital, Flu OPD was established and made functional since 2nd April 2020, with the main objective of screening and testing the suspected people for SARS-CoV-2 infection before entry or admission to the hospital. The functioning of this screening centre was based on standard operating procedures (SOP's) as detailed and subsequently modified based on guidelines issued by the Indian Council of Medical Research (ICMR) and Ministry of Health and Family Welfare (MOHFW). A two-point screening system was established at the beginning where the first point was at main entrance of hospital manned by paramedical staff to screen the patients and their attendants based on the criteria, i.e. travel history, contact history, cough and fever (using thermal gun).

Those patients found as "suspected" but requiring urgent medical attention/hospitalisation were directly referred to trauma and emergency ward for second screening and subsequent treatment. Whereas, those found as "not suspected" and with non-emergency conditions were sent inside the main OPD building for specialist consultation. Based on first level screening, the 'suspected' non-emergency patients were sent to "Flu OPD" for evaluation by medical officers and testing and further management at COVID isolation centre. Although Flu OPD was planned and designed according to the existing health facility infrastructure and local environment, some of the improvements were done based on evidence from other studies and our experience gained during the last COVID peak and were incorporated into its functioning.

The "Flu OPD" was divided into 6 zones: triage area, sampling area, report collection, COVID helpdesk 'A', COVID helpdesk 'B' and COVID admission centre. At a time, a total of 24 staff were deputed from the GIMS pool of staff including Faculty-in-charge (Doctor) 1, Senior resident (Doctor) 1, Junior resident (Doctor) 2, Nursing officer 10, Lab technician 2, Data entry operator (DEO) 2, Security staff 3, Nursing orderly (NO) 2, Housekeeping staff 1. The Flu OPD was operational round the clock, all days of the week and the deputed staff were working in teams of 8 hourly shifts with adequate post-duty-offs to prevent burn-out.

A glass walled two-way public address (PA) system is established to communicate with such patients thus minimising the probability of cross-infection. After consultation from the medical officer on duty, the patient was sent for home isolation based on ICMR guidelines. Treatment advises and medicine kits were also dispensed from this point to ease the care and to minimise patient movement in the hospital complex.

The patients who were "Not-a-suspect" cases for COVID-19 but wanted consultation from doctors were directed to COVID Helpdesk 'A' for the same via separate corridor. The patients who were tested positive for COVID-19 and had mild/no symptoms were directed to COVID Helpdesk 'B' via dedicated pathway **[Figure 1].**

Sample Collection System:
All the suspected were referred to sampling area. Nasopharyngeal and oropharyngeal swab samples were collected round the clock at dedicated sampling area. All the samples were sent to the institutional laboratory and were tested by the reverse transcriptase-polymerase chain reaction (RT-PCR) or by Rapid antigen test (RAT) for cases requiring urgent report. For patients with moderate or severe symptoms were evaluated and admitted on priority to dedicated COVID Isolation/Suspect ward after liaison from the COVID admission centre. For such patients nasopharyngeal samples were collected from inside the COVID Isolation facility, the idea being "Treatment primary and Testing secondary".

Data Collection:
All the patients visiting Flu OPD form 1st January 2022 to 31st March 2022 were line listed and a random convenience sample of 147 patients were included in the study. The questionnaire was peer validated prior to the

study. Any patient with incomplete or missing data or duplicity were excluded from the study. At the time of patient examination, the staffs recorded the data, such as the basic socio-demographic information, presence of COVID-19 symptoms, travel history, history of contact with COVID-19 patients, and covid vaccination status etc.

Data analysis:

Data were compiled in Microsoft Excel and analysed by SPSS version 23. The sociodemographic variables and variables related to COVID-19 screening services was expressed using descriptive statistics like mean, median for continuous data and frequency, proportion for categorical data. Personal identifiers for the patients were removed from the dataset after data extraction to maintain privacy and confidentiality. Appropriate graphical presentation of data was done wherever applicable.

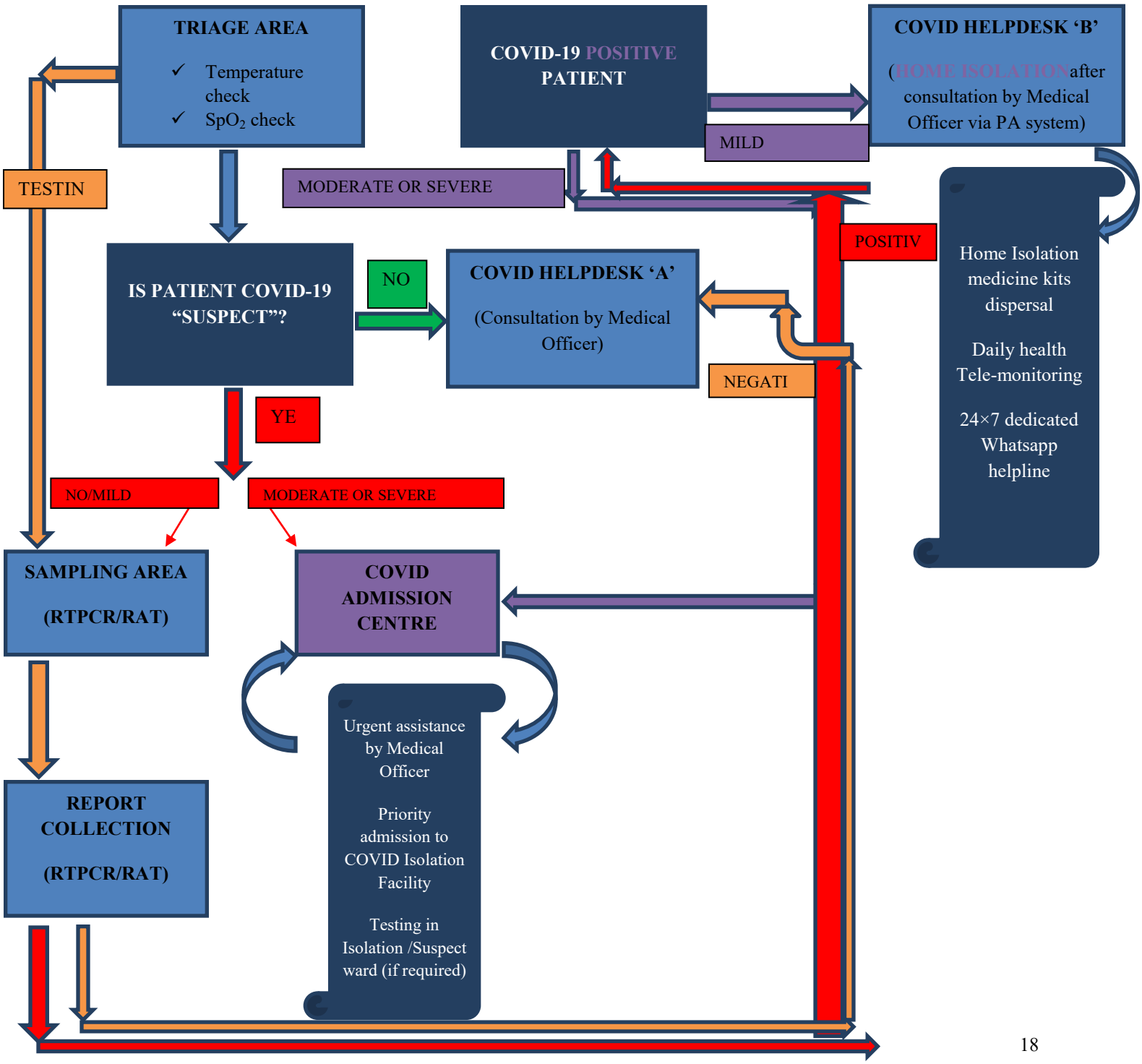

Figure 1. Algorithm for patient flow and services at Flu

Result

A total of 147 patients were evaluated for SARS-CoV-2 infection at Flu OPD during the study duration of 90 days (1st January 2022–31st March 2022). The mean age of patients presenting was 35.8 years. Out of them, a majority, i.e., 57.14% (84) were male and in the 15–59 years age group (85.7%). The median age among male and female patients visiting was 30 years (IQR = 24 to 44). The most common symptoms among patients visiting Flu OPD was cough (97.9%) followed by fever (95.9%) while only 2% didn't have any symptom. [Table 1]

Table 1. Distribution of Flu OPD patients based on socio-demographic profile and symptoms

Variables	Frequency	Percentage
Gender (n=147)		
Male	84	57.1
Female	63	42.9
Age group (n=147)		
≤ 14 years	2	1.36
15-59 years	126	85.7
≥60 years	19	12.9
Education (n=147)		
None	6	4.1
Primary	25	17.0
High school	27	18.4
Intermediate	33	22.5
Graduate and above	56	38.1
Location (n=147)		
Gautam Buddha Nagar	136	92.5
Other districts	11	7.5
Symptoms		
Cough	144	97.9
Fever	141	95.9
Shortness of Breath	29	19.7
Others	8	5.4
Nil	3	2.0

Only 5.5% participants had past history of SARS-CoV-2 infection whereas 2.7% had history of international travel and 6.8% with history of contact with a COVID patient in the last 14 days. A majority of patients (89.8%) were vaccinated with 1st dose of COVID-19 vaccine (Covishield) and 77.5% had completed both doses. **[Table 2]**

Table 2. Distribution of participants according to the past history related to SARS-CoV-2 infection

History	Frequency	Percentage
History of past COVID infection	8	5.5
History of recent international travel (≤14 days)	4	2.7

History of recent contact with COVID positive patient (≤14 days)	10	6.8
History of COVID vaccination • Single dose • Both doses	 132 114	 89.8 77.5

Triage was done for all the patients along with filling the test forms. In terms of following the testing guideline, usage of self-guiding signage, collecting sample for testing the coverage was 100%. However, majority of patients 98.6% agreed that COVID norms like masking, safe-distancing and sanitisation were followed in the sampling area **[Figure 2].**

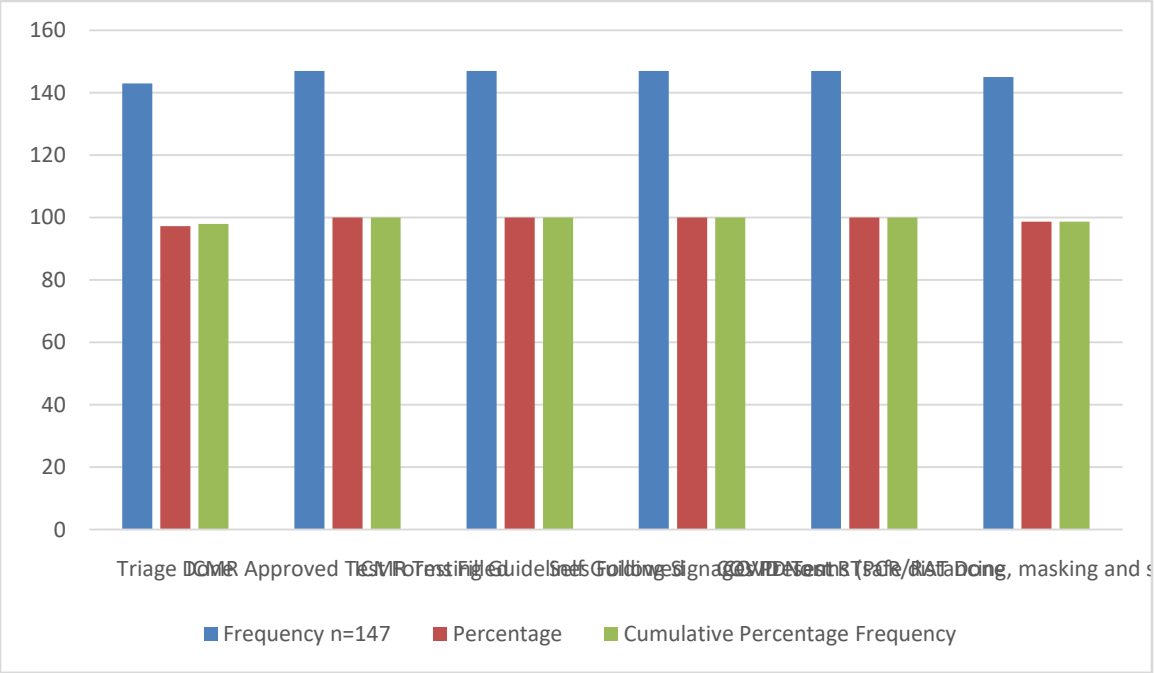

Figure 2. The performance indicators of the Flu OPD in terms of initial screening and testing

The average time taken for testing from point of arrival at Flu OPD was 30 minutes in 72% of all patients. For majority of patients the time taken for testing was 15-30 minutes followed by 30-45 minutes. **[Figure 3]**

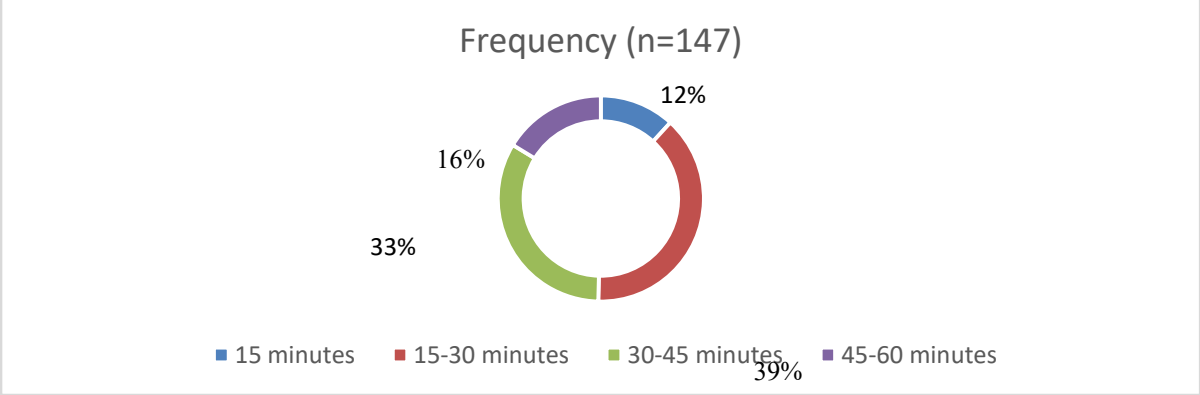

Figure 3. Distribution of the participants according to time taken for sample testing from the point of arrival

Almost all, 97.2% (n=108) of patients requiring admission were attended on priority by the medical officer on duty, with all the requisite documentation and patients were added to dedicated digital helpline (WhatsApp group), even for admitted patients, to address any concern on priority basis **[Figure 4].**

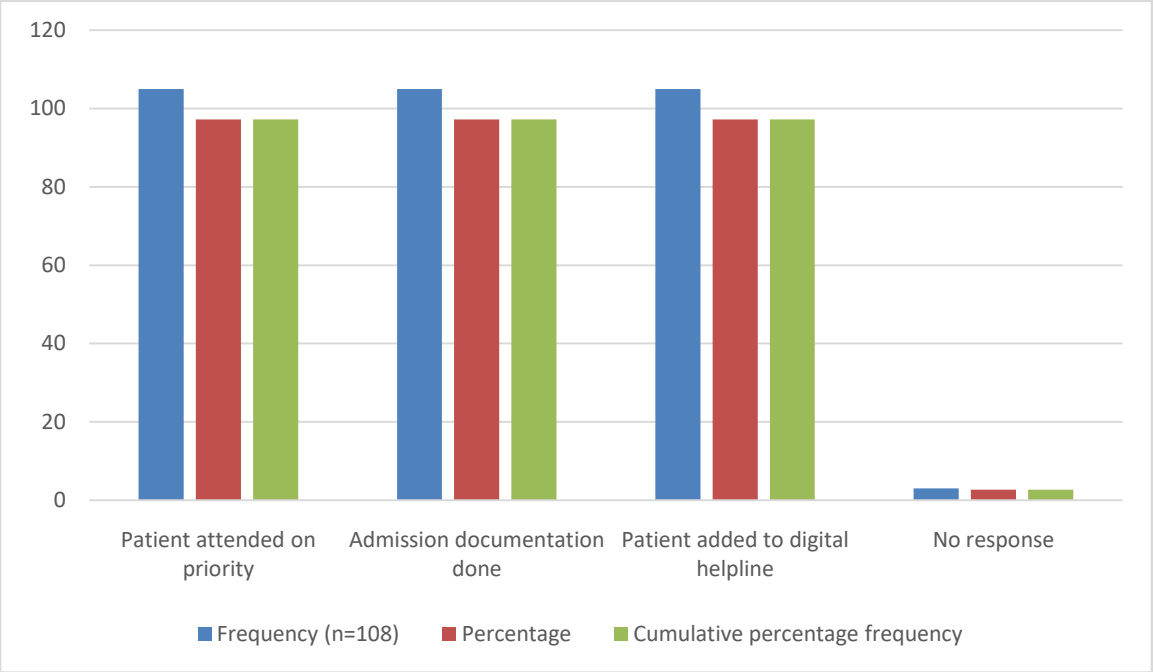

Figure 4. Functioning of Admission centre

The majority of the patients got admission to COVID ward from Flu OPD within 15-30 minutes. Other patients got admitted within of maximum 60 minutes of duration. **[Figure 5].**

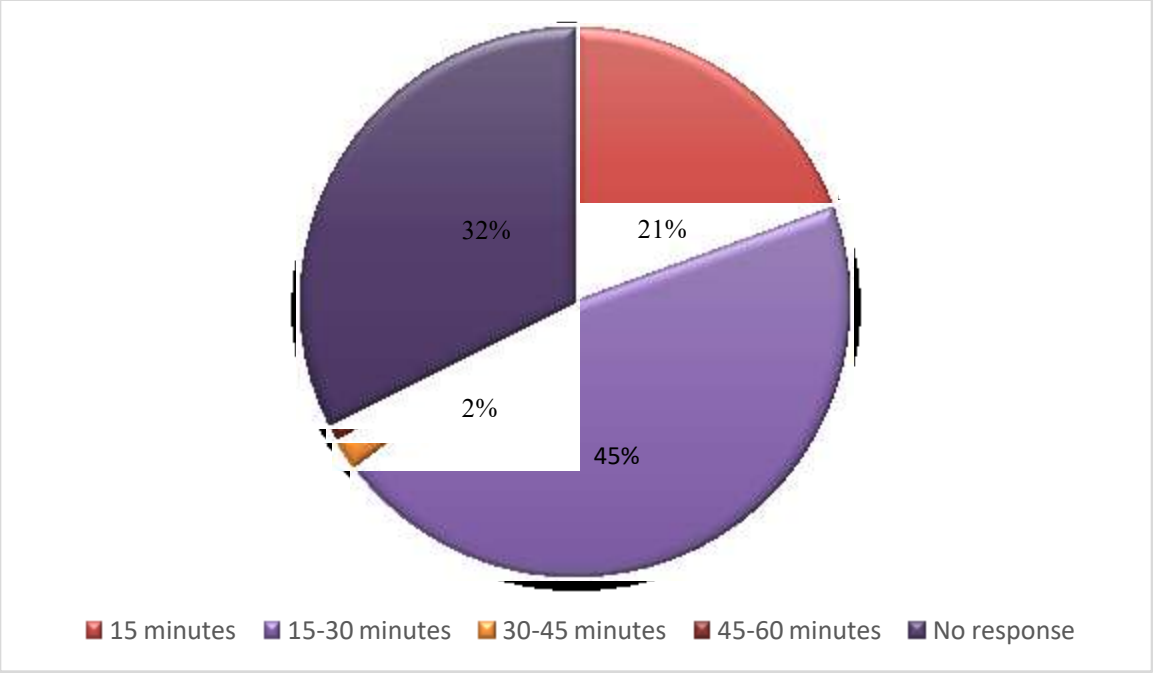

Figure 5. Time taken for admission to COVID wards from the point of arrival

Total 38 patients (26.5%) tested positive with COVID RTPCR/RAT, and having mild/no symptoms were sent to home isolation. Among them 98.4% were attended on priority at COVID helpdesk 'B' and home isolation forms were filled. All patients sent to home isolation from COVID helpdesk 'B' were dispensed with medication kits after consultation from medical officer on duty via public addressal system. Two-third of patients (66.7%) were added to dedicated digital home isolation helpline (WhatsApp group) [Figure 6].

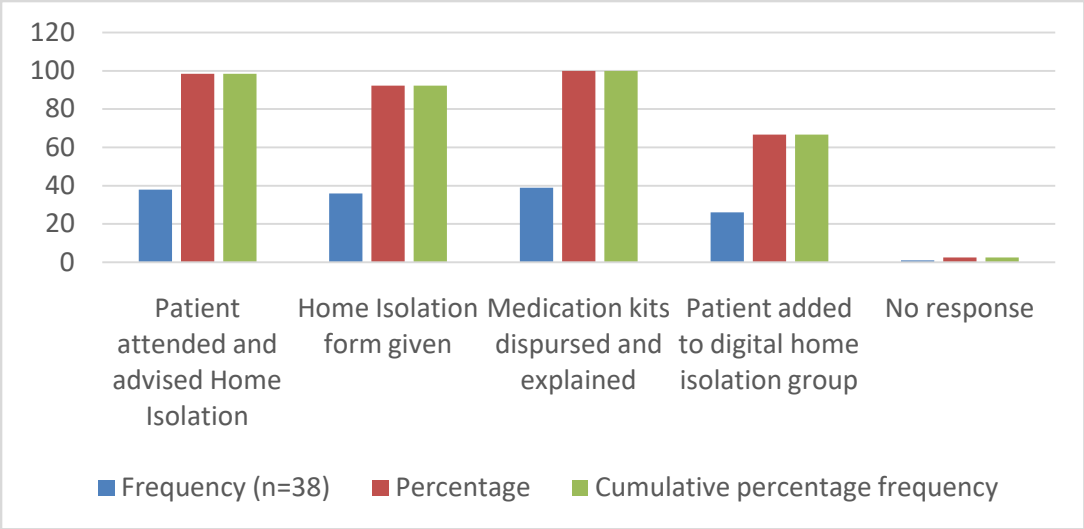

Figure 6. Functioning of COVID Helpdesk 'B' (Home Isolation Centre)

Majority of patients were satisfied with the services provided at various sections of FLU OPD, 93.9% satisfied patients at COVID testing centre; 89.7% at home isolation COVID helpdesk 'B' and 94.2% at COVID admission centre **[Figure 7].**

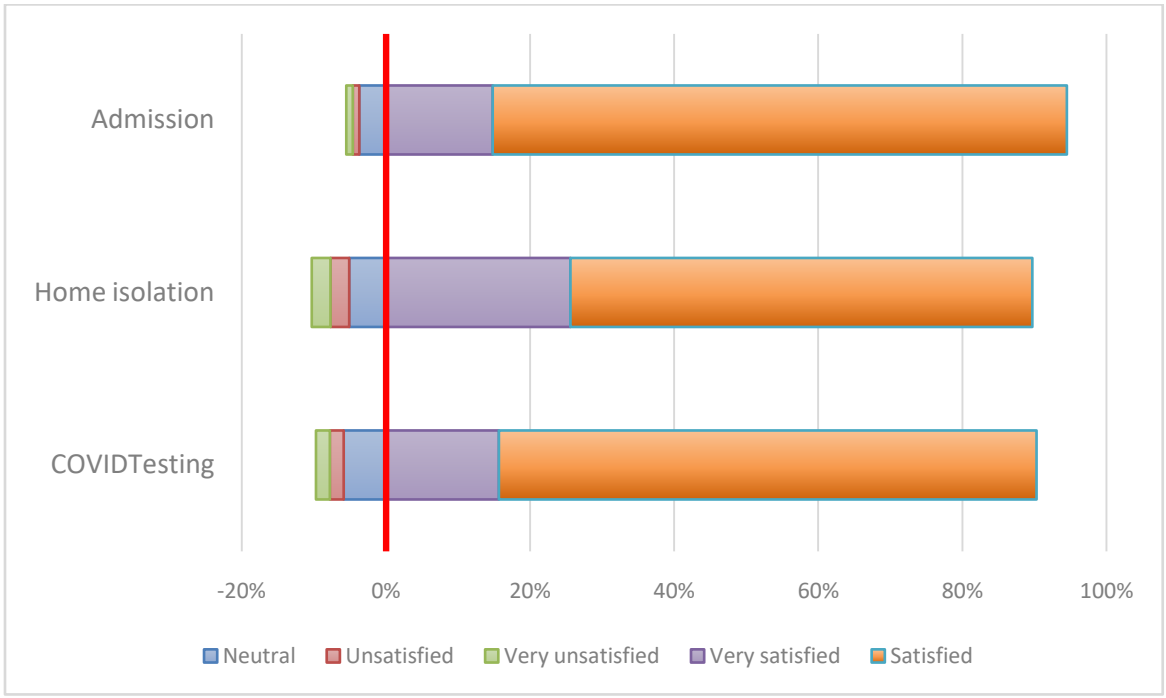

Figure 7. Divergent Bar Chart depicting patient satisfaction scores forCOVID testing, home isolation and admission process.

Table 3. Challenges faced with solution opted and operationalized

Challenges	Solution	Operationalisation
High patient load during COVID-19 waves	One-stop center with smooth patient flow	Streamlined triage area, and dedicated staff allocation, segregation of suspected cases to clear the crowded area and minimizing transmission
Risk of infection spread in general OPD	Separate screening and testing facility	Quick detection and isolation of symptomatic people, mandatory masking, hand hygiene, and designated waiting areas
Delay in diagnosis and treatment initiation	Rapid testing and immediate clinical evaluation	SARS-CoV-2 testing within 30 minutes; admissions finalized within 15 minutes
Limited manpower and resources	Optimal use of existing workforce and infrastructure while keeping them healthy	Task shifting, cross-training of staff, improving the workflow efficiency, and improved duty rosters
Patient dissatisfaction and anxiety	Integration of screening, testing, and treatment under one roof	Reducing waiting time, >90% patients reporting satisfaction
Variants (e.g., Omicron) leading to unpredictable caseload	Flexible, adaptive care model	Regular monitoring, protocol updates, and responsive resource reallocation

Discussion and Analysis:-

The role of screening OPD for COVID - 19 can be discussed from two perspectives, i.e., maintaining hospital function through preventing nosocomial infection and providing diagnostic services to suspected COVID-19 patients from the community in an accurate and timely manner. Much emphasis has been given to separate screening OPD under various names like “fever clinic”, “screening OPD”, “Flu OPD” etc.[8,9] In a resource-constrained setting like India, these screening OPDs played a significant role in both screening and triage during the pandemic.[10] The Flu OPD might have played a crucial role in the prevention of possible nosocomial infection by early diagnosis and segregation of COVID-19 positive patients as well as healthcare workers at GIMS, Greater Noida.

Although Flu OPD was planned and designed according to the existing health facility infrastructure and local environment, some of the improvements based on evidence from other studies were incorporated into its functioning. Modifications like one stop ‘testing, admission and home isolation centre’ were incorporated into its functioning to ease the patient care and minimize the chances of droplet infection in rest of the hospital complex. As far as the Flu OPD patient profile is concerned, the maximum proportion of patient belongs to the male gender and are from the 15–59 years age group. This is in line with the study done by Khan et al., and this may be due to the lesser tendency among the female and elderly population to seek proactive COVID-19 related care because of social and inadequate health-seeking behaviour issues.The maximum proportion of patients (97%) visiting Flu OPD presented with symptoms like cough and fever.

This may be attributed to then prevalent, virulent omicron variant (B.1.1.529) of COVID-19.[7] A majority, 92.5% of patients presenting to Flu OPD belonged to Gautam Buddha Nagar district, as GIMS is the largest tertiary care government hospital located in the same district. About 15% of patients gave history of past COVID-19 infection, history of recent international travel (≤14 days) and history of close contact with a COVID-19 positive patient (≤14 days), thus labelling them as ‘suspect’ as per ICMR specified categories. “Triaging system and workflow” have been suggested as an effective screening method of suspected COVID patients. In our study, two level triaging was done in 97% of all patients presenting to Flu OPD thus ensuring priority care to all patients. In the case of testing indicators, all patients (100%) agreed that ICMR approved RTPCR/RAT test forms were filled, ICMR testing

guidelines were followed, self-guiding patient movement signages were present and COVID RTPCR/RAT test was done. The study revealed that effective testing strategy, disciplined COVID appropriate behaviour and dedicated patient movement corridors in the Flu OPD resulted in good satisfaction scores (94%) for the sampling area. Almost all patients requiring admission (97.2%) were attended on priority by the medical officer on duty, all the requisite documentation was done and patients were added to dedicated digital helpline (whatsapp group), even for admitted patients, to address any concern on priority basis. Digital helpline, assisted to streamline COVID care in a timely manner. In the study, COVID suspect/positive patients having mild/no symptoms were sent to home isolation (26.5%) as per the ICMR specified guidelines.

All patients sent to home isolation from COVID helpdesk 'B' were dispersed with medication kits after consultation from medical officer on duty via public addressal system. 'One point' consultation and medicine kit dispersal, for home isolation patients resulted in minimum movement of suspect/COVID positive patients in the hospital complex. It also made the entire screening, diagnosis and treatment experience hassle-free for the patients which reflected in good satisfaction scores (90%) for the admission centre. Two-third of patients (66.7%) going for home isolation were added to dedicated digital home isolation helpline (whatsapp group). This may be attributed to the reluctance of patients being added to whatsapp group as most of them were asymptomatic/mildly symptomatic. The average time taken from point of arrival to getting tested for COVID-19 was 30 minutes in the majority (72%) of patients. Single testing window, single testing corridor and strict discipline towards COVID appropriate behaviour may be the reasons for slight delay in the average testing time.

Our study was a single centric experience in a short period of time which might be different in different time period as well as for other setting. Therefore the experience can be an additional guidance to establish and sustain. Moreover, the smaller number of the participants may be inadequate to draw any solid conclusion.

Funding: None

Conflict of interest: None

Ethics:
Since the study had used routine health system data, ethical approval was not required. However, it adheredthe code of Federal Research Misconduct Policy related to scientific misconduct including: data fabrication, deceptive and selective reporting of findings, suppression of data and/or distortion of data. It also used all the original research idea, language and thought.

Conclusion:-

Our study gave an overview of the functioning of a COVID-19 screening centre, Flu OPD as a part of pandemic response in a tertiary care hospital. We have demonstrated that 'one stop' COVID care model in the form of Flu OPD is an effective management strategy against evolving public health challenges like COVID-19 especially in resource constrained countries to optimally utilize the manpower and resources in combating the pandemic at large.

Although the Flu OPD has been effective in providing screening, diagnostic and treatment services to patients, various best practices, and evolving strategies based on evidence should be added to it continuously. Inclusion of multiple testing booths, point-of-care testing and broadening the ambit of suspected criteria at screening OPDs can help us to detect more COVID-19 positive cases. Moreover, tertiary care institutions should also plan permanent and separate infectious disease clinics like Flu OPDs and keep on upgrading them to address evolving public health challenges like COVID-19 [Aggarwal A 2012]. As the pandemic continues, it is evident that no single strategy is sufficiently effective. Therefore, the health system must adhere to a holistic approach in dealing with this pandemic for which COVID-19 screening OPDs remains a critical component.

Declaration

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Conflict of interest: None

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