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RESEARCH ARTICLE

TAGORE MEDICAL COLLEGE AND HOSPITAL CHENNAI-600 127 DEPARTMENT OF COMMUNITY MEDICINE COVID 19 VACCINE HESITANCY IN PATIENTS WITH COMORBIDITY: A HOSPITAL-BASED CROSS-SECTIONAL STUDY

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Abstract

Background and aim: A vaccine advisory group to WHO identified complacency, inconvenience in accessing vaccines, and lack of confidence as key reasons underlying hesitancy. Vaccine hesitancy is one of the ten threats to global health in 2019. Hence, the present study was aimed to find out the factors associated with vaccine hesitancy among patients with comorbidities.

Material and methods: A Hospital-based cross-sectional study was conducted among 372 patients with comorbiditieswho attended Tagore medical and Dental College and Hospital, Rathinamangalam, Chennai from June 2020 to August 2021 and were willing to participate in the study. A semi-structured interview schedule was used to obtain information on the socio-demographic profile, behavioral risk factors, and covid 19 vaccine details from the study participants. Data were analyzed using SPSS version 21.0.

Results: Hypertension was the most prevalent (30%) co-morbidity among the study participants followed by Diabetes (27%).In the present study identified reasons for vaccine hesitancy, there was a statistically significant association with the age group, planning to take it soon, fear of adverse reactions of the comorbidities, not interested/not willing, need to take after specialistconsultation, health issues, and need to discuss with family members.**Binary logistic regression** was used to determine the association between vaccine hesitancy and possible factors.The odds of vaccine hesitancy among participants aged more than 60 years were 8 times(adjusted OR=8.044, CI: 1.92–33.1) higher than those aged 18 to 24 years. The odds of vaccine hesitancy among participants who had fear of adverse reactions attributed by the participant was 3 times (adjusted OR=2.824, CI: 1.10–7.25) higher than those without fear of adverse reactions.And the odds of vaccine hesitancy for participants who had a need to take after specialist consultation was 6 times (adjusted OR =5.935, CI: 1.52–23.1) higher than those who had after specialist consultation.

Conclusion: This study concluded that the majority (23.6%) of the study participants mentioned that they were planning to take the vaccine in the future as the reason for delay followed by fear of adverse

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reactions attributed by comorbidities (21.2%) and health issues (18.55%).

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Introduction:-

"Fighting the hesitancy virus"

On 16 January 2021, India had officially flagged off one of the world's largest covid 19 vaccination campaigns to vaccinate its 1.38 billion population. As of 2nd December 2021, while the active cases count for COVID-19 stood at 99,763 cases, India had administered just over 124 crore doses and counting. Even as India crossed one billion covid 19 vaccine doses, only 54.6 percent of India's eligible adult population had taken at least one dose and close to 26 percent had completed both doses. In Tamil Nadu, 7 crore individuals have been fully vaccinated. (1)

The World Health Organization, Strategic Advisory Group of Experts (SAGE) working group on vaccine hesitancy concluded that vaccine **hesitancy(2) refers to delay in acceptance or refusal of vaccination despite the availability of vaccination services. It threatens to reverse progress made in tackling vaccine-preventable diseases.The reason why people choose not to vaccinate is complex and context-specific, varying across time, place, and vaccines.**A vaccine advisory group to WHO identified complacency, inconvenience in accessing vaccines, and lack of confidence as key reasons underlying hesitancy. Health workers, especially those in communities, remain the most trusted advisor and influencers of vaccination decisions, and they must be supported to provide trusted, credible information on vaccines. Vaccine hesitancy is one of the ten threats to global health in 2019.(3)

The COVID-19 vaccines (two vaccines-Covishield: AstraZeneca-Serum Institute of India and Covaxin Bharat Biotech Limited) were authorized by the Drugs Controller General of India (DCGI) for emergency use in India.(4) As people above 60 years and people with co-morbidities above 45 years in the first phase and later above 18 years were announced eligible for vaccination in India. The incidence of COVID 19 is higher in individuals with co-morbidities. Approximately,40% of people with COVID19 -related hospitalization have Type 1 /Type 2 Diabetes Mellitus. The risk of severe morbidity and mortality is 100-250% higher among diabetic individuals. (5–9) Danabal et al study 2021(10) reported ,vaccinehesitancy was high in urban and rural Tamil Nadu.

Rationale

Therefore, understanding its determinants is necessary to aid acceptability and tackle vaccine hesitancy and consequently achieve high coverage for this new vaccine. Hence, this study correctly identifies the factors associated with COVID-19 vaccine hesitancy among rural comorbidity patients and counsel them to accept vaccination. This helped in complete coverage of vaccination in eligible population. And also, it is important to vaccinate them.

At present, there is no study that has analyzed the COVID Vaccine acceptance in individuals with comorbidities. As more and more vaccines get approved and deployed, the focus seemingly shifts from addressing the gaps that had to be overcome to ensure equitable distribution of COVID-19 vaccines nationally to enabling acceptance of the vaccines across states and demographic segments.

Objectives:-

1.To estimate the prevalence of vaccine hesitancy among patients with comorbidities.
2.To find out factors associated with vaccine hesitancy among patients with comorbidities.

Methods And Materials:-

Study design, area, and period

A Hospital-based cross-sectional study done at the Tagore Medical College and Tagore Dental College Hospitals, Rathinamangalam, Chennai between Dec 2021 to Jan 2022.

Study Population

All patients who attended the OPD in the Tagore medical and dental college and Hospital during the data collection period formed the study population.

Inclusion Criteria
All patients with comorbities whose age was above 18 years to more than 60yrs and who were willing to participate were included. This was identified based on the previous follow-up clinical records.

Exclusion Criteria
Those sick patients and not willing to participate in the study were excluded from the study.

Sample size determination
The sample size was calculated based on the Chakraborty et al 2021[11] study that found an 26% prevalence of vaccine hesitancy in India. according to review of literature Prevalence 26%,
Sample size:$4PQ/d^2$,p=26,q=74,d=5%
=4*26*74/5*5=308
Then by adding a 20% non-response rate the final sample size was 370.

Sampling technique and procedure
To get the total list of patients attending the hospital from OPD registry.From that, eligible patients with comorbidity selected using simple random sampling.

Data collection tools
Semi structured interview schedule which contains three parts was used for data collection. Informed consent was obtained from all study participants.

The Questionnaire has three parts-
Section A: Includes the information on socio-demographic determinants. It includes age, gender, education and marital status, type of family, monthly income, no of family members
Section B: Occupational and Individual determinants of the comorbidity patients
Section C: Reasons associated with Covid-19 vaccine hesitancy of the participants

Operational Definition:
Vaccine Hesitancy-
Vaccine **hesitancy [2] refers to delay in acceptance or refusal of vaccination despite the availability of vaccination services.**

Data processing and analysis
The data entered and analysed in MS Excel 2016 and also analyse using SPSS Version 21. The data were expressed in percentages and odds ratio.Chi-Square test and Binomial logistic regression was performed to analyze the test of significance (Factors and Vaccine hesitancy)

Results:-
The present study included 372 participants who visited TMCH and TDCH and had co-morbidities.
The results are discussed in the following sequence:
I. Socio-demographic profile
II. Health and behavioral characteristics of the patients
III. Factors associated with Covid-19 vaccine hesitancy

Socio-Demographic Profile
Table 1:- Frequency distribution of Socio-demographic profile of the comorbidity patients(n=372).

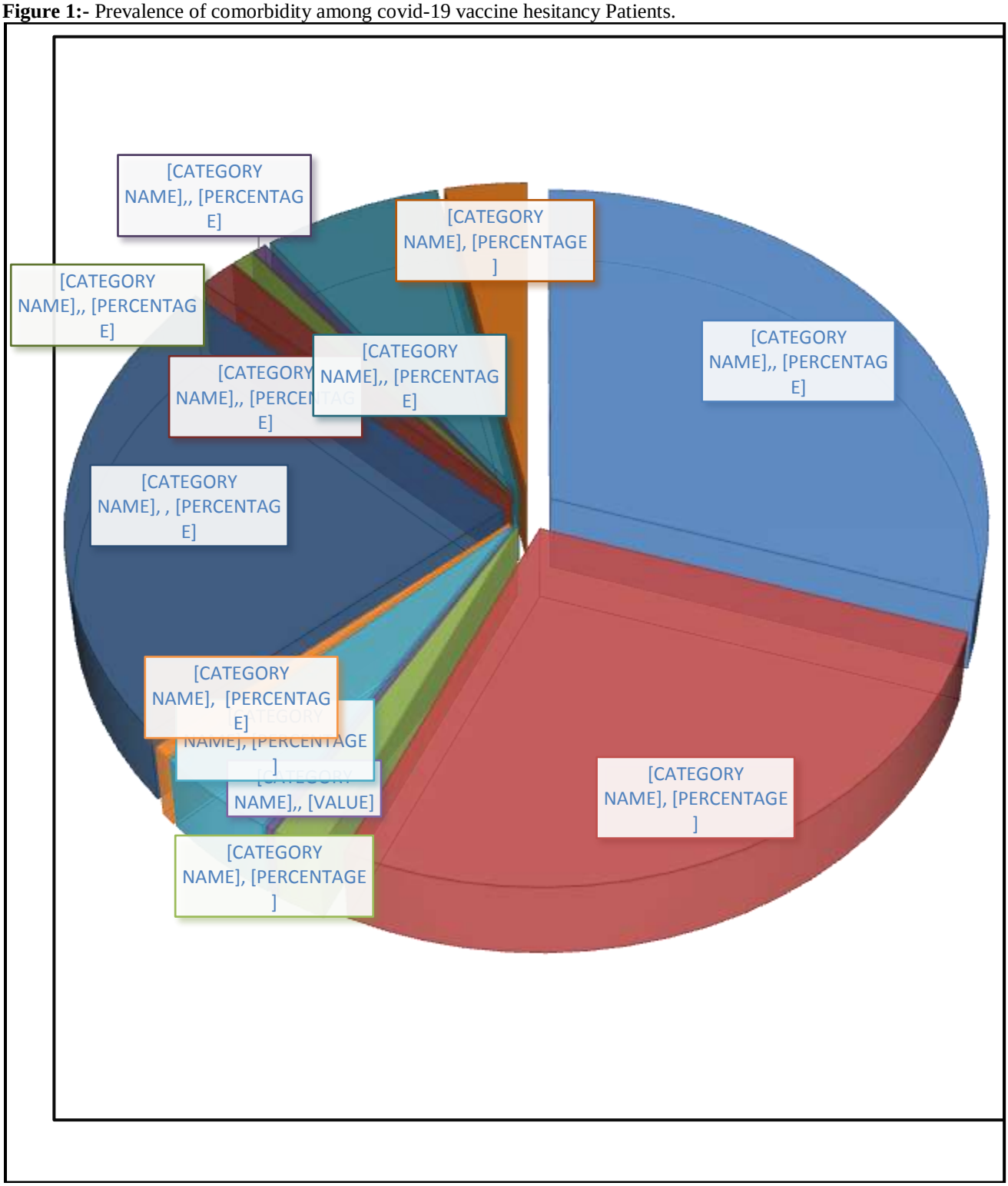
Serial No	Characteristics	Variable	Frequency	Percentage(%)
1.	Gender	Male Female	**211** **161**	**56.7** **43.3**
2.	Age Group	18-24yrs 25-34yrs	44 52	11.8 14

		35-44yrs 45-54yrs 55- 60yrs More than 60yrs	60 **91** 58 67	16.1 **24.5** 15.6 18
3.	Marital Status	Married Single Widow Divorced	**298** 55 18 1	**80.1** 14.8 4.8 0.3
4.	Education	Illiterate Primary School Secondary school Higher Secondary school Diploma	67 48 **102** 62 93	18 12.9 **27.4** 16.7 25
5.	Type of family	Nuclear Joint Three generation Family	**283** 59 30	**76.1** 15.9 8.1
6.	Socioeconomic Class(modified BG Prasad)	Class I Class II Class III Class IV Class V	0 117 **232** 23 0	0 31.5 **62.4** 6.2 0

Among the 372 study participants, 211(56.7%) were males,161(43.3%) were females. Nearly 24.5% of the study population belonged to the age group 45-54 years, majority of 298 (80%) participants were married, followed by single and widowed was 15%, 5% respectively. The majority of 102 (27.4%) participants were completed secondary school education.

Among the study participants, 283 (76%) participants belonged to nuclear family and 59 (16%) participants belonged to joint families. The majority of the workers 232(62.4%) belonged to Class III socioeconomic status according to modified BG Prasad classification. (Table 1)

Figure 1:- Prevalence of comorbidity among covid-19 vaccine hesitancy Patients.



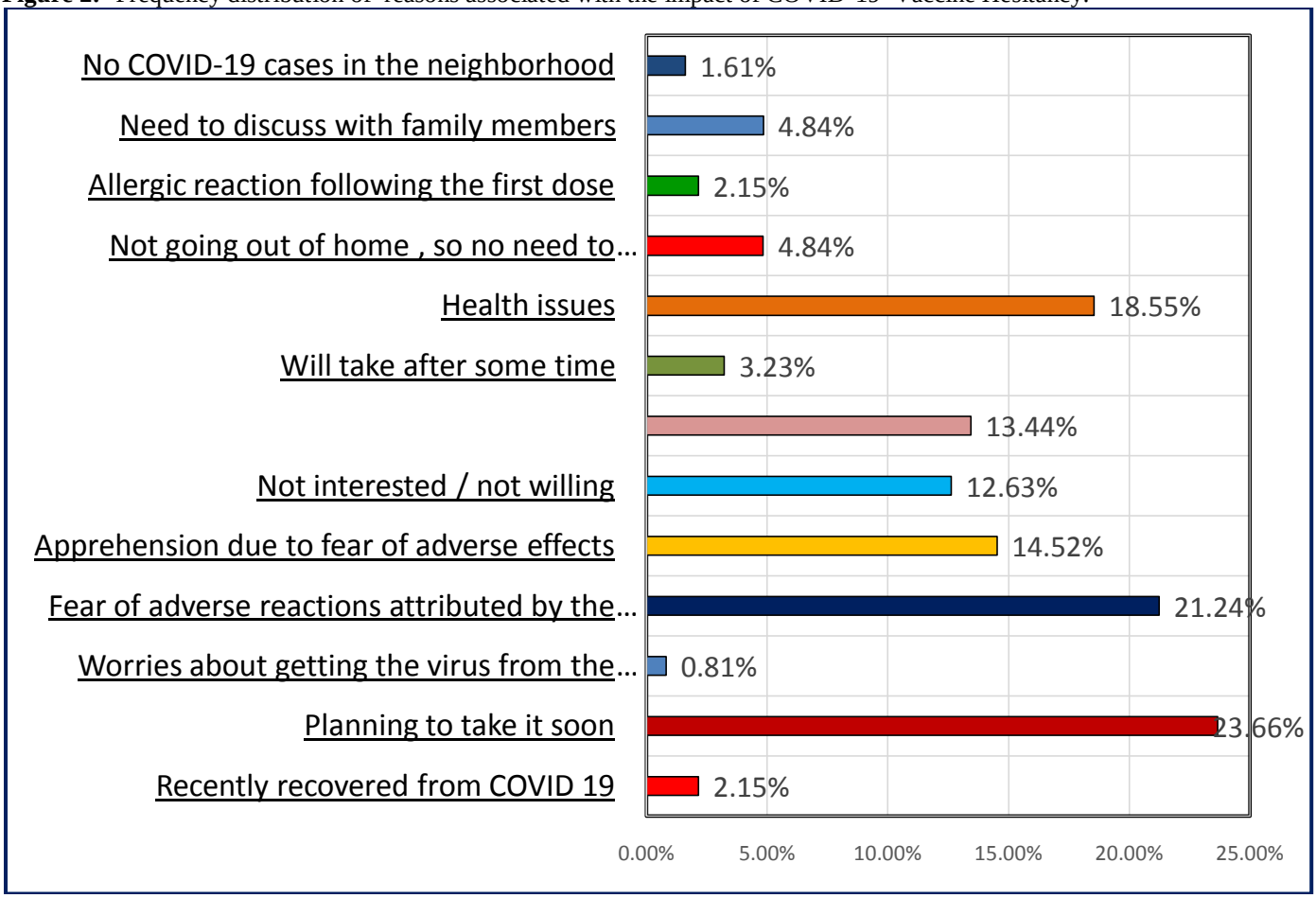
Among the study participants , prevalence of comorbidity among covid-19 vaccine hesitancy patients that Hypertension were the most prevalent (30%) and followed diabetes mellitus were the next prevalent (27%) and renal impairment were 23%. Likewise, chronic drug intake 7% and heart disease 4%.

Table 2:- Behavioral characteristics and Covid-19 vaccine status of the patients.

Serial No	Characteristics	Variable	Frequency	Percentage(%)
1.	Smoking	Yes No	**60** **312**	**16.1** **83.9**
2.	Alcohol	Yes No	**62** **310**	16.7 83.3
3.	Covid-19 Vaccine receive	One dose None	**114** **258**	**30.6** **69.4**
4.	If one dose, Which vaccine receive(114)	Covaxin Covishield	**17** **97**	**4.6** **26.1**

Among the study participants the use of smoking tobacco and alcohol consumption were 16.1% and 16.7% respectively.Those received one dose covid 19 vaccine are30.6%,among them received covaxin 4.6% and covishield 26.1%.

Figure 2:- Frequency distribution of reasons associated with the impact of COVID-19 Vaccine Hesitancy.



The reasons for covid-19 vaccine hesitancy reported predominantly were planning take it soon 23.6%,fear of adverse reactions attributed by comorbities 21.2% and health issues 18.55%.

Table 3:- Factors Influencing Vaccine Hesitancy.

	Variable	**Covid 19 Vaccine Status**			
		One dose only receive N(%)	**No vaccine receive N(%)**	**Chi-square Value**	**P-value**
1.Age Group	18 to 24 yrs	25(56.8)	19(43.2)		
	25 to 34 yrs	18(34.6)	34(65.4)		
	35 to 44yrs	16(26.7)	44(73.3)		
	45 to 55yrs	28(30.8)	63(69.2)		
	55 to 60 yrs	14(24.1)	44(75.9)		
	More than 60 yrs	13(19.4)	54(80.6)	**20.154**	**P<0.001***
2. Planning to take it soon	No	62(21.8)	222(78.2)	**43.884**	**P<0.001***
	Yes	52(59.1)	36(40.9)		
3. Fear of Adverse Reactions	No	104(35.5)	189(64.5)	**15.268**	**P<0.001***
	Yes	10(12.7)	69(87.3)		
4. Not interested/Not Willing	No	91(28)	234(72)	**8.468**	**P<0.004***
	Yes	23(48.9)	24(53.1)		
5. Need to take after specialist consultation	No	111(34.5)	211(65.5)	**16.508**	**P<0.001***
	Yes	3(6)	47(94)		
6. Health Issues	No	107(35.3)	196(64.7)	**16.751**	**P<0.001***
	Yes	7(10.1)	62(89.9)		
7. Need to discuss with family members	No	103(29.1)	251(70.9)	**8.260**	**P<0.004***
	Yes	11(61.1)	7(38.9)		

Among the study participants reasons for vaccine hesitancy, there was a statistically significant association with the age group, planning to take it soon, fear of adverse reactions of the comorbidities , not interested/not willing, need to take after specialist consultation, health Issues and need to discuss with family members.

Multivariate Analysis

Logistic regression was performed to ascertain the effects of multiple factors on vaccine hesitancy among comorbidity patients.

Table 4:- Binomial logistic regression between variables and prevalence of vaccine hesitancy.

S.No	Variables	**pvalue**	Adjusted Odds ratio	95% Confidence Interval	
				Upper	Lower
1.	Age Group				
	18 to 24 yrs(R)	------	-------	-------	---------
	25 to 34 yrs	**0.023***	**3.776**	1.20	11.88
	35 to 44yrs	**0.013***	**5.573**	1.42	21.75
	45 to 55yrs	**0.021***	**4.689**	1.25	17.49
	55 to 60 yrs	**0.018***	**5.491**	1.33	22.61
	More than 60 yrs	**0.004***	**8.044**	1.952	33.151
2.	Fear of adverse reactions attributed by the participant to co-morbidities(no)(R-yes)	**0.031***	2.824	1.100	7.251

3.	Need to take after specialist Consultation(no) (R-yes)	**0.010***	**5.935**	1.522	23.141

The odds of vaccine hesitancy among participants aged more than 60 years was 8 times higher than those aged 18 to 24 years. The odds of vaccine hesitancy among participants aged more than 60 years was 8 times(adjusted OR=8.044, CI: 1.92–33.1) higher than those aged 18 to 24 years.

The odds of vaccine hesitancy among participants who had fear of adverse reactions attributed by the participant was 3 times (adjusted OR=2.824, CI: 1.10–7.25) higher than those without fear of adverse reactions.

And the odds of vaccine hesitancy for participants who had a need to take after specialist consultation was 6 times (adjusted OR =5.935, CI: 1.52–23.1) higher than those who had after specialist consultation.

Discussion:-

In the present study, most common morbidities reported were, hypertension (30%) and followed by diabetes mellitus (27%) and renal impairment(23%) , chronic drug intake (7%) and heart disease 4% among the study participants, the consumption of tobacco ,alcohol among the study participants were 16.1% and 16.7% respectively.Those about 30% of the study participants had received one dose of covid vaccine and among them had received covaxin (4.6%) and covishield(26.1%).In the present study, majority (23.6%) of the study participants mentioned that they were planning to take the vaccine in future as the reason for delay followed by fear of adverse reactions attributed by comorbities (21.2%) and health issues (18.55%).

In a study done in Tamilnadu by**Nachimuthu et al** [(12)]reported amongstudy participants werehypertension (36%) and followed by renal impairment(23%).Same study reported , that they were having fear of adverse reactions attributed by comorbities(26.4%) followed bythe health issues (19%) as the reason for delay which are similar to our study.

In a study done in India by **Chandani et al** [(13)] **study** reported among study participants were unaware of the vaccine(20%) is the reason for delay , this is in contrast to our study findings that, majority (23.6%) of the study participants mentioned that they were planning to take the vaccine in future as the reason for delay.

Similar findings were reported byfindings revealed by the **Danabal et al study 2021**[10] ,**Chakraborty et al** study 2021 [11] study observed that the major reasons for vaccine hesitancy and refusal in India are concerns about side effects and safety of the available vaccines.

Vaccine hesitations arise from the day of the announcement of the development of vaccines against COVID-19 worldwide. Various reasons for this include the efficacy of the vaccines, safety, duration of protection, health literacy, misinformation, lack of trust,need for additional information and cost of the vaccines [(14–16)] as per the studies conducted across countries.

Conclusion:-

This study concluded that vaccine hesitancy among the patient with comorbidity was a barrier to achieving high vaccination coverage against newly emerging infectious diseases.There was a statistically significant association with the age group, planning to take it soon, fear of adverse reactions of the comorbidities , not interested/not willing, need to take after specialist consultation, health Issues and need to discuss with family members

Recommendations:-

Behavioural change communication- physicians or specialist play a crucial role in this education & awareness as the people mostly rely on them for decision making and to break the hesitance.

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