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Original Research Paper

ASSESSMENT OF ADVERSE DRUG INTERACTIONS DURING IN THE COVID-19 VACCINE AND PUBLIC UNDERSTANDING OF VACCINE IN SOUTH INDIA

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ABSTRACT:

Background: SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) is a recently detected member of the human coronavirus family that was discovered during a highly transmissible respiratory disease outbreak in Wuhan, China in 2019. Despite the lack of an established antiviral treatment for COVID-19, many vaccines experiment was launched. Various vaccination candidates for emergency use authorization (EUA) had been announced by some international health agencies by the beginning of 2021. COVID-19 vaccines are believed to improve vaccinated individual's immune systems, providing protection and a more long-term solution. **Purpose of study**: There is few research on the adverse effects/reactions and awareness of COVID-19 vaccines, the goal of this study was to investigate the severity, causality of adverse reactions/effects and compare the effect of COVID-19 vaccine among the general public. **Methods**: The data collection form has been prepared. The data will be collected through the vaccination site and the ADR (adverse drug reaction) will be monitored through phone calls. The severity of the ADR was assessed by using MODIFIED HARTWIG AND SIEGEL SCALE and the causality was assessed by using NARANJO SCALE. Google forms have been created and thereby assessing how people aware of the COVID-19 vaccine. **Results:** A total 1125 people in Tamilnadu were assessed over a period of 6 months. All participants were reported that they experience at least one ADR. the range of COVID-19 vaccine adverse reactions were pain at injection site by 935 out of 1125 participants; body pain reported by 576 out of 1125; fever reported 493 out of 1125; headache reported by 326 out of 1125; chills reported by 103 out of 1125 participants. **Conclusion:** Majority of reported adverse reactions were described as mild to moderate reactions.

Key Words: COVID-19 vaccine ADR, severity, COVID-19 vaccine awareness, causality, pregnancy, lactation

INTRODUCTION:

Coronavirus disease (COVID-19) is a devastating viral infection that still affects many places throughout the world. SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) is a novel coronavirus strain that has spread over the world, posing a huge public health threat (Pal M, Berhanu G and Desalegn C, 2020).On March 11, 2020, the World Health Organization (WHO) designated the COVID-19 epidemic to be a pandemic (Cucinotta D and Vanelli M, 2020). Most governments' ground strategy was to decrease disease transmissibility, frequently by non-pharmaceutical interventions (NPIs), such as enforcing mask policies, hand sanitization, social distance, travel restrictions, school closures, and partial or complete lockdowns (Nicola M et al., 2020). Nonetheless, it is obvious that humans cannot sustain long-term social isolation or the use of face masks, and there are presently no particular antiviral drugs for COVID-19. As a result, the only way to stop this pandemic is to produce a COVID-19 vaccination that has both therapeutic and socioeconomic advantages (Sharun K et al., 2020). COVID-19 vaccines was expected to strengthen the immune system of the vaccinated individuals offering protection and a more permanent solution . In the United Kingdom and other nations, a COVID-19 vaccination is being used (Nisha jha et al., 2021). On January 16, 2021, India began its COVID-19 immunization campaign. Healthcare and

frontline workers were the initial set of recipients. The second group, which includes persons over 60 years old (as of January 1, 2022) and those in the 45–59 year age bracket with comorbid diseases, began getting vaccines on March 1, 2021, while those over 45 years old began receiving immunizations on April 1, 2021.The Central Drugs Standard Control Organization (CDSCO) in India has granted emergency use authorization to two vaccines: Covishield (AstraZeneca's vaccine, produced by Serum Institute of India) and Covaxin (made by Bharat Biotech Limited). Beneficiaries were encouraged to obtain two doses with a minimum time interval of 28 days during the initial launch phase of the immunization programme. The time interval between the two doses of the covishield vaccination has been increased from four to eight weeks, despite the fact that the second dosage of covaxin can be taken four to six weeks after the first (Arumuganainar suresh et al., 2021). Vaccines safety are very essential to ensure that the public will be safe after taking vaccination for prevention diseases (Yaser al-woraf et al., 2021). Vaccination resistance to the COVID-19 vaccine is still an issue across the world. Fear of vaccination due to the lack of clinical testing and adverse effects. To increase vaccination safety, it is critical to identify and report vaccine adverse drug reactions. There are few research on COVID -19 vaccination awareness and side effects. The goal of this study was to determine the ADR and vaccination awareness for COVID-19 (Marwa O elgendy and Mohamed E.A. abdelrahim, 2021).

MATERIALS AND METHODS:

Ethical Clearance

This study was approved by Institutional Ethics Committee, Ethics Committee For Research on Human Subjects(ECRHS), JKKMMRF's Annai JKK Sampoorani Ammal College of Pharmacy with reference number EC/PHARM.D/2021-08.

ADVERSE DRUG REACTION FOLLOWING COVID-19 VACCINATION

It is an Observational study conducted in Primary Health Centre, Tirunelveli, Primary Health Centre, Pallakapalayam, Government Hospital, karimangalam during the period of 6 months. The study population was 1125 vaccinated peoples. The inclusion criteria are, people who are undergoing covid -19 vaccine, people of age above 18 , people who are in pregnancy and lactating and the exclusion criteria are, people who are not willing to participate in the study and people who are not responding properly

Study Procedure

The protocol was approved by ethical committee of institution. The data collection form has been prepared, it contains people demographic and covid vaccine-related data. The data will be collected through the vaccination site and the ADR will be monitored through phone calls. The severity of the ADR was assessed by using MODIFIED HARTWIG AND SIEGEL SCALE and the causality was assessed by using NARANJO SCALE. The ADR was reported to pharmacovigilance.

AWARENESS OF COVID-19 VACCINATION AMONG PUBLIC-SOUTH INDIA.

It is an observational cross-sectional study conducted various area in south India during a period of 6 months. The inclusion criteria are people of age above 18 , people who are using a smart phone and the exclusion criteria are people who do not agree to participate in the study. The study population are selected using the RAOSOFT SAMPLE SIZE CALCULATOR with 5% margin of error, 95% confidence interval and 50% response distribution, the estimated sample size is found to be 218.

Study Procedure

Google forms have been created and thereby assessing how people aware of the COVID vaccine. Patient information leaflet was attached on that google form.

STATISTICAL ANALYSIS

The data collected were tabulated , analyzed using statistical tools and Microsoft excel 2019. the statistical procedure was undertaken with the help of statistical package Instat and prism version 6.0.

RESULT AND DISCUSSION:

Adverse Drug Reaction Of Covid-19 Vaccine

Out of 1125 vaccinated people, 194 were 1st dose covaxin vaccinated people and 175 were second dose covaxin vaccinated people. 931 were covishield 1st dose vaccinated people and 168 were covishield 2nd dose vaccinated people.

(Figure 1): Adverse Drug Reaction of Covid-19 Vaccine

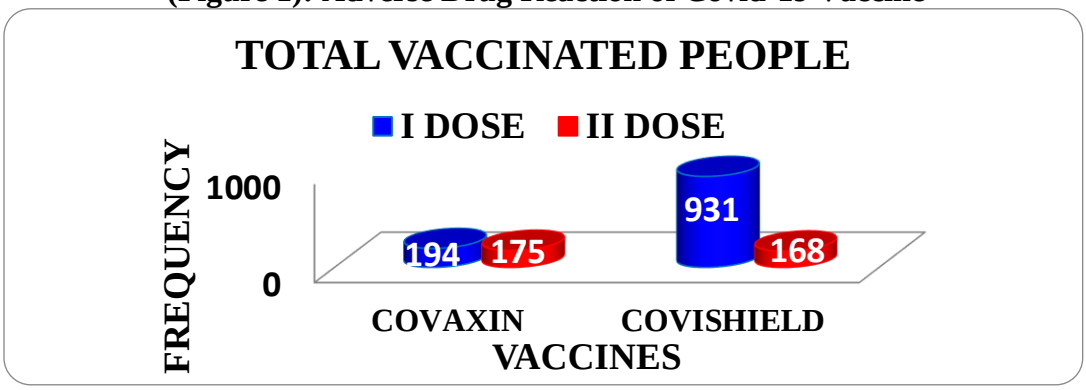

Fig. 1. Representative ADR of covid-19 vaccination

Adverse Drug Reaction Among Various Age Group

Total of 1125 vaccinated people among them 356 people in 18-25, 218 people in 26-35, 204 people in 36-45, 181 people in 46-55 and 165 people in above 55. When comparing with other age group category, people in the age group of 18-25 had experienced more adverse drug reaction. Fatigue(19.3%), joint pain(3.8%) , eye irritation(3.8%) were more experienced in 46-55 age group. swelling at inj site(3.2%), diarrhea (1.8%) were more experienced in 26-35 age group. Back pain(1.8%) was more experienced in above 55 age group. The similar study was conducted by Dr. Rajeev Jayadevan were analysed that the youngest people had experienced more ADR when compared to others .

Table: 1

ADR	18-25(%) (N=356)	26-35(%) (N=218)	36-45(%) (N=24)	46-55(%) (N=181)	above 55(%) (N=165)
Fever	54.9	45.4	36.7	39.2	31.5
Body Pain	55.1	51.8	50.4	55	38.1
Headache	34.7	30.2	25.9	27.6	20
Chills	12.6	9.6	8.3	7.1	4.2
Pain At Injection Site	**87.9**	**85.7**	**85.2**	**79**	**70.9**
Fatigue	17.3	16	12.2	**19.3**	11.5
Joint Pain	3	4.1	2.4	**3.8**	4.2
Eye Irritation	3.3	3.6	3.4	**3.8**	3
Swelling At Injection Site	1.9	**3.2**	2.4	1.6	2.4
Dizziness	2.8	1.8	2.4	2.7	2.4
Diarrhea	0.5	**1.8**	1.4	1.1	2.4
Nausea	1.6	0.4	0.9	0.5	1.2
Back Pain	0.8	0.4	0.4	1.1	**1.8**
Cold	1.1	1.3	0.4	0.5	0.6
Anorexia	0.8	0.4	0.4	0.5	1.2

Adverse Drug Reaction For Male(N=507)

Out of 1125 vaccinated people, 507 are male. When compared to other ADR more people experienced pain at injection site(76.3%). Few of them experienced rare ADRs such as dry cough(0.5%), eye irritation(2.7%).

Table: 2

ADR	(%)
Fever	40.8
Body Pain	43.9
Headache	22.6
Chills	7.1
Pain At Injection Site	**76.3**
Fatigue	16.1
Joint Pain	1.7
Nausea	0.7
Swelling At Injection Site	1.3
Eye Irritation	**2.7**
Dizziness	1.3
Shivering	0.3
Back Pain	0.1
Redness Of Eye	0.3
Vomiting	0.3
Hypersomnia	0.1
Neck Pain	0.1
Shoulder Pain	0.1
Diarrhea	1.1
Insomnia	0.7
Chest Tightness	0.3
Dry Cough	**0.5**
Cold	0.5
Increased Heart Rate	0.1
Throat Pain	0.1
Anorexia	0.3
Medicine Smell On Nose	0.1

Adverse Drug Reaction Of Female (N=618)

Out of 1125 vaccinated people, 618 are female. They had experienced menstrual irregularities(0.1%), fatigue(1.5%), breast pain(0.1%), alopecia(0.1%) as a rare ADR and most of them experienced with pain at injection site.

Table: 3

ADR	(%)
Fever	46.7
Body Pain	57.9
Headache	34.3
Chills	11

Pain At Inj Site	**89.3**
Fatigue	15
Joint Pain	4.5
Nausea	1.2
Swelling In Inj Site	2.7
Eye Irritation	3.7
Breathlessness	0.1
Dizziness	2.5
Shivering	0.4
Back Pain	1.1
Redness Of Eye	0.4
Vomiting	1.7
Diarrhea	1.6
Itching	0.1
Right Hand Pain	0.6
Synosis	0.1
Cold	1.4
Hypersomnia	0.4
Polyphagia	0.4
Bitter Taste	0.3
Anorexia	0.9
Abdominal Pain	0.3
Menstrual Irregular	**0.1**
Breast Pain	**0.1**
Alopecia	**0.1**

Adverse Drug Reaction Of Pregnancy Women

Total of 1125 vaccinated people , 27 people are pregnant women . They had experienced fatigue(48.1%) , body pain(62.9%) and dizziness(7.4%).

Table: 4

ADR OF PREGNANCY	**FREQ (N=27)**	**(%)**
Fever	16	59.2
Body Pain	**17**	**62.9**
Headache	12	44.4
Chills	3	11
Pain At Injection Site	**25**	**92.5**
Fatigue	**13**	**48.1**
Joint Pain	5	18.5
Eye Irritation	2	7.4

Dizziness	**2**	**7.4**
Vomiting	1	3.7
Cold	1	3.7
Diarrhea	1	3.7
Cough	2	7.4

Adverse Drug Reaction Of Lactating Women

Total of 1125 vaccinated people, 16 people are lactating mothers. They had experienced hypogalactoria (6.2%) and their babies had experienced vomiting(6.2%) and diarrhea(18.7%).

Table: 5

ADR	FREQ (N=16)	%
Fever	5	31.5
Body Pain	12	75
Headache	8	50
Pain At Injection Site	**15**	**93.7**
Fatigue	5	31.2
Swelling At Injection Site	1	6.2
Eye Irritation	2	12.5
Dizziness	1	6.2
Back Pain	1	6.2
Redness Of Eye	1	6.2
Vomiting	1	6.2
Hypogalactoria	**1**	**6.2**
Vomiting For Baby	**1**	**6.2**
Diarrhea For Baby	**3**	**18.7**
Cold	1	6.2

Adverse Effects Among People With Comorbid Conditions(Diabetes, Hypertension, Asthma, Epilepsy)

The adverse effect of comorbid people, a total of 159 people gets vaccinated, when compared to other adverse effect pain at injection site(122) shows more in comorbid people. Swelling in the gum(1) as a rare ADR.

Table: 6

ADR	NO OF PARTICIPANTS(N=159)
Fever	59
Body Pain	84
Headache	36
Chills	7
Pain At Injection Site	**122**

Fatigue	23
Joint Pain	5
Nausea	2
Swelling At Injection Site	5
Eye Irritation	4
Dizziness	5
Shivering	1
Back Pain	3
Vomiting	5
Cold	3
Diarrhea	1
Anorexia	2
Sweating	3
Insomnia	2
Hypersomnia	1
Swelling In The Gum	**1**
Chest Tightness	1
Bitter Taste	1
Polyphagia	1
Breast Pain	1

Adverse Drug Reaction Of Covishield Vaccinated People

Total of 931 covishield vaccinated people, among them 168 had completed their vaccination(2 doses). Many people had experienced more ADR after their 1st dose when compared to 2nd dose.

Table: 7

ADR	COVISHIELD 1 DOSE		COVISHIELD II DOSE	
	FREQ (N=931)	**(%)**	**FREQ (N=168)**	**(%)**
Fever	460	**49.4**	32	19
Pain At Injection Site	792	**85**	109	64.8
Body Pain	525	**56.3**	33	19.6
Headache	312	**33.5**	13	7.7
Chills	100	**10.7**	2	1.1
Fatigue	163	**17.5**	10	5.9
Joint Pain	35	**3.7**	1	0.5

Swelling In Injection Site	23	**4**	3	1.7
Breathlessness	1	**3**	1	0.5
Shivering	5	**0.7**	2	1.1
Dizziness	28	**0.5**	3	1.7
Back Pain	7	**0.4**	1	0.5
Cold	11	**0.4**	2	1.1
Swelling In Gum	1	**0.3**	0	0.5
Smell Of Medicine	1	**0.2**	0	1.7
Eye Irritation	38	**0.1**	1	0.5

Adverse Drug Reaction Of Covaxin Vaccinated People

Total of 194 covaxin vaccinated people among them 175 had completed their vaccination(2 doses). Many people had experienced more ADR after their 2nd dose when compared to 1st dose. Pain at injection site was occurred more in 2nd dose when compared to 1st dose. Nausea, redness in eye, hypersomnia, vomiting , bitter taste, dry throat, breast pain- these ADR occurred less than 2% of the people in 1st dose and no one experienced these ADR in the 2nd dose.

Table: 8

	COVAXIN I DOSE		**COVAXIN II DOSE**	
ADR	**FREQ (N=194)**	**(%)**	**FREQ (N=175)**	**(%)**
Fever	37	19	20	**11.4**
Pain At Inj Site	148	76.2	142	**90.1**
Body Pain	56	28.8	40	**22.8**
Headache	16	8.2	13	**7.4**
Chills	3	1.5	6	**3.4**
Fatigue	12	6.1	13	**7.4**
Joint Pain	2	1	2	**1.1**
Swelling In Inj Site	0	0	2	**1.1**
Eye Irritation	2	1	0	**0**
Dizziness	0	0	1	**0.5**
Back Pain	1	0.5	0	**0**
Hypersomnia	1	0.5	0	**0**
Diarrhea	1	0.5	0	**0**
Neck Pain	2	1	1	**0.5**
Itching	1	0.5	0	**0**
Right Hand Pain	1	0.5	0	**0**
Shoulder Pain	2	1	1	**0.5**
Synosis	1	0.5	0	**0**

Adverse Drug Reaction Of First Dose Vaccinated People

Out of 1125 1st dose vaccinated people , 194 were vaccinated with covaxin and 931 were vaccinated with covishield. When compared to covaxin 1st dose vaccinated people , covishield 1st dose vaccinated people may experienced more ADR. Dry throat, leg swelling, menstrual irregular, increased HR, Hypogalactorea, breast pain, numbness of finger, alopecia, anorexia, abdominal pain, constipation, swelling in gum, breathlessness- these ADRs occurred less than 1% of covishield 1st dose vaccinated people and no any people with covaxin 1st dose had experienced these ADRs.

Table: 9

	COVISHIELD I DOSE		COVAXIN I DOSE	
ADR	**FREQ (N=194)**	**(%)**	**FREQ (N=175)**	(%)
Fever	460	**49.4**	37	19
Body Pain	525	**56.3**	56	28.8
Headache	312	**33.5**	16	8.2
Chills	100	**10.7**	3	1.5
Pain At Inj Site	792	**85**	148	76.2
Fatigue	163	**17.5**	12	6.1
Joint Pain	35	**3.7**	2	1
Nausea	12	**1.2**	0	0
Swelling In Inj Site	23	**2.4**	0	0
Eye Irritation	38	**4**	2	1
Dizziness	28	**3**	0	0
Shivering	5	**0.5**	0	0
Back Pain	7	**0.7**	1	0.5
Redness Of Eye	4	**0.4**	0	0
Vomiting	13	**1.3**	0	0
Cold	11	**1.1**	0	0
Insomnia	5	**0.5**	0	0
Hypersomnia	3	**0.3**	1	0.5
Diarrhea	15	**1.6**	1	0.5
Polyphagia	3	**0.3**	0	0
Chest Tightness	3	**0.3**	0	0
Right Hand Pain	3	**0.3**	0	0
Throat Pain	2	**0.2**	0	0
Dry Cough	2	**0.2**	0	0

Adverse Drug Reaction Of Second Dose Vaccinated People

Out of 343 2nd dose vaccinated people, 175 were vaccinated with covaxin and 168 were vaccinated with covishield. When compared to covishield 2nd dose vaccinated people, covaxin 2nd dose vaccinated people had more ADR .

Table: 10

ADR	COVISHIELD II DOSE (N=168)		COVAXIN II DOSE (N=175)	
	FREQ	%	FREQ	%
Fever	32	19	**20**	**11.4**
Body Pain	33	19	**40**	**22.8**
Headache	13	7.7	**13**	**7.4**
Chills	2	1.1	**6**	**3.4**
Pain At Inj Site	109	64.8	**142**	**81.1**
Fatigue	10	5.9	**13**	**7.4**
Joint Pain	1	0.5	**2**	**1.1**
Swelling In Injection Site	3	1.7	**2**	**1.1**
Eye Irritation	1	0.5	**0**	**0**
Breathlessness	1	0.5	**0**	**0**
Dizziness	3	1.7	**1**	**0.5**
Shivering	2	1.1	**0**	**0**
Back Pain	1	0.5	**0**	**0**
Cold	2	1.1	**0**	**0**
Polyphagia	1	0.5	**0**	**0**
Dry Cough	3	1.7	**0**	**0**

Adverse Drug Reaction Of People With Social History

Out of 1125 vaccinated people ,16 people had social history. When compared to covishield vaccinated people, fever (66.6%) was more experienced in covaxin vaccinated people and most of them experienced with pain at injection site.

Table: 11

ADR	COVISHIELD (N=19)		COVAXIN (N=3)	
	FREQ	(%)	FREQ	
Fever	**5**	**38.4**	**2**	**66.6**
Body Pain	6	46.1	0	0
Headache	2	15.3	0	0
Chills	2	15.3	0	0
Pain At Injection Site	**9**	**69.2**	**2**	**66.6**
Fatigue	3	23	0	0
Swelling At Injection Site	1	7.6	0	0
Dizziness	1	7.6	0	0
Body Heat	1	7.6	0	0

Severity Assessment Of Adverse Drug Reaction Of Covid-19 Vaccine

covishield vaccinated people having mild level 1 and moderate level 3 adverse effects. On the other side, Covaxin vaccinated people having only mild level adverse effects only in severity assessment. A similar study was conducted by Nisha Jha et al., were analyzed for causality and severity using the widely accepted Naranjo algorithm and modified Hartwig and Siegel scales to assess the covishield severity (moderate level 3)

Table: 12

Gender	Covishield			Covaxin		
	Possible	**Probable**	**Severity**	**Possible**	**Probable**	**Severity**
Male	318(76.2%)	56(13.4%)	**Mild level1 and moderate level3**	28(31.1%)	54(60%)	Mild level1
Female	414(85.7%)	59(11.4%)	**Mild level1 and moderate level3**	29(27.8%)	73(70.1%)	Mild level 1

Overall Adverse Drug Reaction Of Covaxin And Covishield.
When compared to overall adverse drug reaction, the pain at injection site occurred in many people.

Table: 13

SYMPTOMS	COVAXIN	COVISHIELD	*p*-VALUE*
Pain at injection site	146	789	<0.0001*
Body pain	54	522	
Fever	36	457	
Headache	15	311	
Chills	3	100	

The *p*-value is significantly associated.

AWARENESS OF COVID-19 VACCINE

Gender-Wise Distribution Of Awareness About Covid 19 Vaccination

Total of 274,118 was male and 156 were female. Out of 118 males, (93.2%) were aware of the covid vaccine, (94.9%) know covishield vaccine, (85.5%) know covaxin vaccine, (38.9%) know sputnik vaccine, (11%) Johnson and Johnson vaccine and (8.4%) know modern vaccine. Nearly (91.5%) participant was vaccinated and (8.4%) participant was not vaccinated. Most of the participants respond the reason for not vaccinated was, they already vaccinated (61.8%), worried about safety (9.3%), worried about side effect (16.1%), unsure about the caution of vaccine (4.2%), unavailability of vaccine (5.9%). The (48.3%) participant was answered the covid vaccine was not effective and (14.4%) were answered the covid vaccine was effective. (94%) of the participant have knowledge about the dose of the covid vaccine and (5.9%) were not know the dose of the covid vaccine. Most of the participants have well knowledge about covid vaccine dose (ie, 2 doses of covid vaccine) and to take the same brand covid vaccine for both the doses. (96.6%) know the time interval between the first dose and second dose and (94.9%) were known to take the second dose of vaccine compulsory. (55.9%) were answered NO to take covid vaccine along with other vaccine and (67.7%) were answered that comorbid person should consult with medical professionals before taking the covid vaccine. (44.9%) were answered covid attack will happen after vaccination and (38.1%) were answered MAY BE that covid attack will happen after vaccination. (94%) have knowledge about the benefit of covid vaccine and most of them answered develop immunity (74.5%), reduce the risk of covid-19 disease

(74.5%) and protect the people around you (44%). (66.1%) know the covid-19 recovered person will wait for 4-8weeks after recovery from covid symptoms before getting the vaccine and (24.5%) were not know about the covid symptoms recovered before getting the vaccine. Most of the participant thought that immunity after infection with the virus is better than immunity after taking the vaccine. (44.9%) of the participant think that not the covid vaccine itself infect with the coronavirus. (76.2%) were thought that covid vaccine should be mandatory for everyone. (80.5%) were answered that the covid vaccine was not available for people under 18 years of age. Most of them prefer the covishield vaccine. (40%) from the newspaper, (59.3%) from medical professionals, (66.1%) from social media, (45.7%) from friends and family, (44%) from television were known the sources of covid 19 vaccine information. A similar study was conducted by Marwa O. Elgendy, the majority of participants (73%) believed that the vaccine should be mandatory for everyone. The majority of participants (86.5%) said that those recovery from coronavirus can receive the vaccine after approximately 3 months. The effectiveness of the current vaccines for the coronavirus is… Were (44.8%) answered high, (48.3%) answered moderate and (6.9%) answered low. A lot of participants thought that the vaccine may infect them with the virus.

Out of 156 females, (98%) were aware of the covid vaccine, (96.1%) know covishield vaccine, (88.4%) know covaxin vaccine, (35.2%) know sputnik vaccine, (4.4%) Johnson and Johnson vaccine, and (11.5%) know modern vaccine. Nearly (95.5%) participant was vaccinated and (4.4%) participant was not vaccinated. Most of the participants respond the reason for not being vaccinated was, they were vaccinated (75.6%), worried about safety (6.4%), worried about side effects (8.3%), unsure about the caution of vaccine (0.6%), unavailability of vaccine (1.2%). The (60%) participant was answered the covid vaccine was not effective and (11.5%) were answered the covid vaccine was effective. (98.7%) of the participant have knowledge about the dose of the covid vaccine and (1.2%) were not know the dose of the covid vaccine. Most of the participant have well knowledge about covid vaccine dose (ie, 2 doses of covid vaccine) and to take the same brand covid vaccine for both doses. (99.3%) know the time interval between the first dose and second dose and (96.1%) were known to take the second dose of vaccine compulsory. (60.8%) were answered NO to take covid vaccine along with other vaccine and (75.6%) were answered that comorbid person should consult with medical professionals before taking the covid vaccine. (51.2%) were answered covid attack will happen after vaccination and (30.7%) were answered MAYBE that covid attack will happen after vaccination. (95.5%) know the benefit of the covid vaccine and most of them answered develop immunity (67.3%) reduce the risk of covid-19 disease (75%) and protect the people around you(46.1%). (68.5%) know the covid-19 recovered person will wait for 4-8weeks after recovery from covid symptoms before getting the vaccine and (23.7%) were not know about the covid symptoms recovered before getting the vaccine. Most of the participants thought that immunity after infection with the virus is better than immunity after taking the vaccine. (40%) of the participant think that not the covid vaccine itself infect with the coronavirus. (75%) were thought that covid vaccine should be mandatory for everyone. (73.7%) were answered that the covid vaccine was not available for people under 18 years of age. Most of them prefer the covishield vaccine. (44.8%) from the newspaper, (53.2%) from medical professionals, (60.2%) from social media, (41.6%) from friends and family, (43.5%) from television were known the sources of covid 19 vaccine information. A similar study was conducted by Marwa O. Elgendy, the majority of participants (73%) believed that the vaccine should be mandatory for everyone. The majority of participants (86.5%) said that those recovery from coronavirus can receive the vaccine after approximately 3 months. The effectiveness of the current vaccines for the coronavirus is. Were (44.8%) answered high, (48.3%) answered moderate, and (6.9%) answered low. A lot of participants thought that the vaccine may infect them with the virus.

Table: 14

Question	Answer	Male		Female	
		Freq	(%)	Freq	(%)
Do You Aware Of COVID-19 Vaccine?	yes	110	93.2	153	98.0
	no	8	6.7	3	1.9
Do You Know What Are The COVID-19 Vaccines Are Available In India?	Covaxin	101	85.5	138	88.4
	covishield	112	94.9	150	96.1
	Sputnik	46	38.9	55	35.2
	Moderna	10	8.4	18	11.5
	Johnson and	13	11	7	4.4

	Johnson				
	None of above	-		-	
Have You Taken COVID-19 Vaccine?	Yes	108	91.5	149	95.5
	no	10	8.4	7	4.4
If No, What Is The Reason ? (multiple choice can be selected)	Fear	16	13.5	13	8.3
	Worried about safety	11	9.3	10	6.4
	Worried about side effect	19	16.1	13	8.3
	Not willing to enter hospital	4	3.3	1	0.6
	Unavailability of vaccine	7	5.93	2	1.2
	Unsure about the caution of vaccine	5	4.2	1	0.6
	Vaccinated	73	61.8	118	75.6
	Not enough clinical data	7	5.9	4	2.5
Do You Think The COVID-19 Vaccine Is Not Effective?	Yes	17	14.4	18	11.5
	no	57	48.3	95	60.8
	May be	44	37.2	43	27.5
Do You Know How Many Doses Should Be Taken?	Yes	111	94.0	154	98.7
	no	7	5.9	2	1.2
If Yes, How Many Doses?	1	12	10.1	14	8.9
	2	103	87.2	137	87.8
	3	0	0	5	3.2
Do you know to take the same brand COVID-19 vaccine for both the doses?	Yes	107	90.6	146	93.5
	No	11	9.3	10	6.4
Do You Know The Time Interval Between First And Second Dose?	Yes	114	96.6	155	99.3
	no	4	3.3	1	0.6
Do you know to take the second dose of COVID-19 vaccine compulsory	Yes	112	94.9	150	96.1
	No	6	5.0	6	3.8
Do you know that covid-19 vaccine can be taken along with other vaccine?	Yes	26	22.0	36	23.0
	No	66	55.9	95	60.8
	May be	26	22.0	25	16.0
Do You Know That Comorbid(other disease) Person Should Consult With Medical Professionals Before	yes	80	67.79661	118	75.64103
	No	21	17.79661	22	14.10256
	May be	17	14.40678	16	10.25641

Taking The COVID-19 Vaccine?					
Do You Think That COVID Attack Will Happen After Vaccination?	Yes	53	44.91525	80	51.28205
	No	20	16.94915	28	17.94872
	May be	45	38.13559	48	30.76923
Do you know the benefit of taking COVID-19 vaccination?	Yes	111	94.0678	149	95.51282
	No	7	5.932203	7	4.487179
If yes, what are the benefits?(multiple choice can be selected)	Develop immunity	88	74.57627	105	67.30769
	Reduce the risk of Covid-19 disease	88	74.57627	117	75
	Protect the people around you	52	44.0678	72	46.15385
	None of above	8	6.779661	6	3.846154
Do you know that covid-19 recovered person will wait for 4-8 weeks after recovery from COVID symptoms before getting the vaccine?	Yes	78	66.10169	107	68.58974
	No	11	9.322034	12	7.692308
	Don’t know	29	24.57627	37	23.71795
Do you know to take precaution after the COVID-19 vaccination?	Yes	46	38.98305	140	89.74359
	No	9	7.627119	9	5.769231
	May be	13	11.01695	7	4.487179
Do you think that immunity after infection with the virus is better than immunity after taking the COVID-19 vaccine?	Yes	67	56.77966	92	58.97436
	No	14	11.86441	32	20.51282
	May be	37	31.35593	32	20.51282
Do you think that the COVID-19 vaccine itself infects you with the coronavirus?	Yes	37	31.35593	50	32.05128
	No	53	44.91525	63	40.38462
	May be	28	23.72881	43	27.5641
Do you think that the COVID-19 vaccine should be mandatory for every one?	Yes	90	76.27119	117	75
	No	11	9.322034	14	8.974359
	May be	17	14.40678	25	16.02564
Do you know that the COVID-19 vaccine is not available for people under 18 years of age?	Yes	95	80.50847	115	73.71795
	No	15	12.71186	29	18.58974
	May be	8	6.779661	12	7.692308
What vaccine do you prefer	Covaxin	14	11.86441	19	12.17949
	covishield	92	77.9661	125	80.12821
	Sputnik	8	6.779661	7	4.487179

	Moderna	1	0.847458	3	1.923077
	Johnson and Johnson	0	0	0	0
From which source you came to know about the covid-19 vaccine information	Newspaper	48	40.67797	70	44.87179
	Medical professionals	70	59.32203	83	53.20513
	Social media	78	66.10169	94	60.25641
	Friends and family	54	45.76271	65	41.66667
	tv	52	44.0678	68	43.58974

Education-Wise Distribution Of Awareness About Covid 19 Vaccination

Total of 274, 163 were UG students,101 were PG students and 10 were school students. Out of 163 UG students, (95.7%) were aware of covid vaccine, (88.3%) know covishield vaccine, (85.2%) know covaxin vaccine, (29.4%) know sputnik vaccine, (6.7%) Johnson and Johnson vaccine and (1.8%) know Moderna vaccine. Nearly (94.4%) participant was vaccinated and (5.5%) participant was not vaccinated. Most of the participant respond the reason for not being vaccinated was, they already vaccinated (68%), worried about safety (4.9%), worried about side effect (6.7%), unsure about the caution of vaccine (0%), unavailability of vaccine (1.8%). The (13.4%) participant were answered the covid vaccine was not effective and (51.5%) were answered the covid vaccine was effective. (95.7%) of the participant have knowledge about the dose of the covid vaccine and (4.2%) were not know the dose of the covid vaccine. Most of the participant have well knowledge about covid vaccine dose (ie, 2 doses of covid vaccine) and to take the same brand covid vaccine for both doses. (98.1%) know the time interval between the first dose and second dose and (93.8%) were known to take the second dose of vaccine compulsory. (113.4%) were answered NO to take covid vaccine along with other vaccine and (67.4%) were answered that comorbid person should consult with medical professionals before taking the covid vaccine. (42.3%) were answered covid attack will happen after vaccination and (34.9%) were answered MAYBE that covid attack will happen after vaccination. (93.2%) know the benefit of the covid vaccine and most of them answered develop immunity (68.7%) reduce the risk of covid-19 disease (52.7%) and protect the people around you (39.2%). (60.1%) know the covid-19 recovered person will wait for 4-8weeks after recovery from covid symptoms before getting the vaccine and (28.2%) were not know about the covid symptoms recovered before getting the vaccine. Most of the participants thought that immunity after infection with the virus is better than immunity after taking the vaccine. (39.2%) of the participant think that not the covid vaccine itself infect with the coronavirus. (76%) were thought that covid vaccine should be mandatory for everyone. (77.9%) were answered that the covid vaccine was not available for people under 18 years of age. Most of them prefer the covishield vaccine. (44.1%) from the newspaper, (23.3%) from medical professionals, (64.4%) from social media, (33.7%) from friends and family, (44.7%) from television were known the sources of covid 19 vaccine information. A similar study was conducted by Marwa O. Elgendy, the majority of participants (73%) believed that the vaccine should be mandatory for everyone. The majority of participants (86.5%) said that those recovery from coronavirus can receive the vaccine after approximately 3 months. The effectiveness of the current vaccines for the coronavirus is. Were (44.8%) answered high, (48.3%) answered moderate, and (6.9%) answered low. A lot of participants thought that the vaccine may infect them with the virus.

Out of 101 PG students, (98%) were aware of the covid vaccine, (73.2%) know covishield vaccine, (90%) know covaxin vaccine, (47.5%) know sputnik vaccine, (18.8%) Johnson and Johnson vaccine and (12.8%) know Moderna vaccine. Nearly (98%) participant was vaccinated and (1.9%) participant was not vaccinated. Most of the participants respond the reason for not being vaccinated was, they already vaccinated (64.3%), worried about safety (5.9%), worried about side effects (12.8%). The (11.8%) participant was answered the covid vaccine was not effective and (56.4%) were answered the covid vaccine was effective. (99%) of the participant have knowledge about the dose of the covid vaccine and (0.9%) were not know the dose of the covid vaccine. Most of the participant have well knowledge about covid vaccine dose (ie, 2 doses of covid vaccine) and to take the same brand covid vaccine for both doses. (99%) know the time interval between the first dose and second dose and (98%) were known to take the second dose of vaccine compulsory. (121.7%) were answered NO to take covid vaccine along with other vaccine and

(83.1%) were answered that comorbid person should consult with medical professionals before taking the covid vaccine. (60.3%) were answered covid attack will happen after vaccination and (30.6%) were answered MAYBE that covid attack will happen after vaccination. (98%) have knowledge about the benefit of the covid vaccine and most of them answered develop immunity (71.2%) reduce the risk of covid-19 disease (67.3%) and protect the people around you (52.4%). (82.1%) know the covid-19 recovered person will wait for 4-8weeks after recovery from covid symptoms before getting the vaccine and (14.8%) were not know about the covid symptoms recovered before getting the vaccine. Most of the participants thought that immunity after infection with the virus is better than immunity after taking the vaccine. (46.5%) of the participant think that not the covid vaccine itself infect with the coronavirus. (75.2%) were thought that covid vaccine should be mandatory for everyone. (72.2%) were answered that the covid vaccine was not available for people under 18 years of age. Most of them prefer the covishield vaccine. (39.6%) from the newspaper, (23.3%) from medical professionals, (60.3%) from social media, (26.7%) from friends and family, (40.5%) from television were known the sources of covid 19 vaccine information. A similar study was conducted by Marwa O. Elgendy, the majority of participants (73%) believed that the vaccine should be mandatory for everyone. The majority of participants (86.5%) said that those recovery from coronavirus can receive the vaccine after approximately 3 months. The effectiveness of the current vaccines for the coronavirus is. Were (44.8%) answered high, (48.3%) answered moderate and (6.9%) answered low. A lot of participants thought that the vaccine may infect them with the virus.

Out of 10 school students, (80%) were aware of the covid vaccine, (90%) know the covishield vaccine, (90%) know covaxin vaccine, (20%) know the sputnik vaccine. Nearly (40%) participant was vaccinated and (60%) participant was not vaccinated. Most of the participant respond the reason for not being vaccinated was, they already vaccinated (30%), worried about side effect (10%), not willing to enter hospital(10%), unavailability of vaccine(10%), not enough clinical data(20%) . The (10%) participant was answered the covid vaccine was not effective and (20%) were answered the covid vaccine was effective. (90%) of the participant have knowledge about the dose of the covid vaccine and (10%) were not know the dose of the covid vaccine. Most of the participant have well knowledge about covid vaccine dose (ie, 2 doses of covid vaccine) and to take the same brand covid vaccine for both doses. (90%) know the time interval between the first dose and second dose and (100%) were known to take the second dose of vaccine compulsory. (80%) were answered NO to take covid vaccine along with other vaccine and (40%) were answered that comorbid person should consult with medical professionals before taking the covid vaccine. (30%) were answered covid attack will happen after vaccination and (50%) were answered MAYBE that covid attack will happen after vaccination. (90%) know the benefit of the covid vaccine and most of them answered develop immunity (80%) reduce the risk of covid-19 disease (70%) and protect the people around you (60%). (40%) know the covid-19 recovered person will wait for 4-8weeks after recovery from covid symptoms before getting the vaccine and (50%) were not know about the covid symptoms recovered before getting the vaccine. Most of the participants thought that immunity after infection with the virus is better than immunity after taking the vaccine. (50%) of the participant think that not the covid vaccine itself infect with the coronavirus. (70%) were thought that covid vaccine should be mandatory for everyone. (100%) were answered that the covid vaccine was not available for people under 18 years of age. Most of them prefer the covishield vaccine. (40%) from the newspaper, (30%) from medical professionals, (60%) from social media, (60%) from friends and family, (40%) from television were known the sources of covid 19 vaccine information. A similar study was conducted by (Marwa O. Elgendy, 2020), the majority of participants (73%) believed that the vaccine should be mandatory for everyone. The majority of participants (86.5%) said that those recovery from coronavirus can receive the vaccine after approximately 3 months. The effectiveness of the current vaccines for the coronavirus is. Were (44.8%) answered high, (48.3%) answered moderate, and (6.9%) answered low. A lot of participants thought that the vaccine may infect them with the virus.

Table: 15

Questions	Answer	UG		PG		SCHOOLING	
		Freq	(%)	Freq	(%)	Freq	(%)
Do You Aware Of	yes	156	95.7	99	98	8	80
	no	7	4.2	2	1.9	2	20

COVID-19 Vaccine?							
Do You Know What Are The COVID-19 Vaccines Are Available In India?	Covaxin	139	85.2	91	90	9	90
	covishield	144	88.3	74	73.2	9	90
	Sputnik	48	29.4	48	47.5	2	20
	Moderna	3	1.8	13	12.8	0	0
	Johnson and johnson	11	6.7	19	18.8	0	0
	None of above	0	0	0	0	0	0
Have You Taken COVID-19 Vaccine?	Yes	154	94.4	99	98	4	40
	no	9	5.5	2	1.9	6	60
If No, What Is The Reason ? (multiple choice can be selected)	Fear	15	9.2	4	3.9	1	10
	Worried about safety	8	4.9	6	5.9	0	0
	Worried about side effect	11	6.7	13	12.8	1	10
	Not willing to enter hospital	0	0	0	0	1	10
	Unavailability of vaccine	3	1.8	0	0	1	10
	Unsure about the caution of vaccine	0	0	0	0	1	10
	Vaccinated	111	68	65	64.35644	3	30
	Not enough clinical data	2	1.22	3	2.970297	2	20
Do You Think The COVID-19 Vaccine Is Not Effective?	Yes	22	13.4	12	11.88119	1	10
	no	84	51.5	57	56.43564	2	20
	May be	58	35.5	26	25.74257	4	40
Do You Know How Many Doses Should Be Taken?	Yes	156	95.7	100	99.0099	9	90
	no	7	4.2	1	0.990099	1	10
If Yes, How Many Doses?	1	19	11.6	6	5.940594	1	10
	2	14	8.5	91	90.09901	8	80
	3	2	1.2	2	1.980198	1	10

Do you know to take the same brand COVID-19 vaccine for both the doses?	Yes	148	90.7	97	96.0396	8	80
	No	15	9.2	4	3.960396	2	20
Do You Know the Time Interval Between First And Second Dose?	Yes	160	98.15951	100	99.0099	9	90
	no	3	1.840491	1	0.990099	1	10
Do you know to take the second dose of COVID-19 vaccine compulsory	Yes	153	93.86503	99	98.0198	10	100
	no	10	6.134969	2	1.980198	0	0
Do you know that covid-19 vaccine can be taken along with other vaccine?	Yes	85	52.14724	41	40.59406	0	0
	No	185	113.4969	123	121.7822	8	80
	May be	29	17.79141	20	19.80198	2	20
Do You Know That Comorbid (other disease) Person Should Consult with Medical Professionals Before Taking The COVID-19 Vaccine?	yes	110	67.48466	84	83.16832	4	40
	No	28	17.17791	11	10.89109	4	40
	May be	25	15.33742	6	5.940594	2	20
Do You Think That COVID Attack Will Happen After Vaccination?	Yes	69	42.33129	61	60.39604	3	30
	no	38	23.31288	9	8.910891	2	20
	May be	57	34.96933	31	30.69307	5	50
Do you know the benefit of taking COVID-19 vaccination?	Yes	152	93.25153	99	98.0198	9	90
	No	11	6.748466	2	1.980198	1	10
If yes, what	Develop	112	68.71166	72	71.28713	8	80

are the benefits? (multiple choice can be selected)	immunity						
	Reduce the risk of Covid-19 disease	86	52.76074	68	67.32673	7	70
	Protect the people around you	64	39.2638	53	52.47525	6	60
	None of above	9	5.521472	1	0.990099	1	10
Do you know that covid-19 recovered person will wait for 4-8 weeks after recovery from COVID symptoms before getting the vaccine?	Yes	98	60.1227	83	82.17822	4	40
	No	19	11.65644	3	2.970297	1	10
	Don't know	46	28.22086	15	14.85149	5	50
Do you know to take precaution after COVID-19 vaccination?	Yes	138	84.66258	91	90.09901	7	70
	No	12	7.361963	5	4.950495	1	10
	May be	14	8.588957	5	4.950495	2	20
Do you think that immunity after infection with the virus is better than immunity after taking the COVID-19 vaccine?	Yes	94	57.66871	62	61.38614	3	30
	No	26	15.95092	17	16.83168	3	30
	May be	43	26.38037	22	21.78218	4	40
Do you think that the COVID-19 vaccine itself infect you with the coronavirus?	Yes	53	32.51534	32	31.68317	2	20
	No	64	39.2638	47	46.53465	5	50
	May be	46	28.22086	23	22.77228	3	3
Do you think that the COVID-19 vaccine should be mandatory for everyone?	Yes	124	76.07362	76	75.24752	7	70
	no	16	9.815951	8	7.920792	1	10
	May be	23	14.11043	17	16.83168	2	20

Do you know that the COVID-19 vaccine is not available for people under 18 years of age?	Yes	127	77.91411	73	72.27723	10	100
	No	25	15.33742	19	18.81188	0	0
	May be	11	6.748466	9	8.910891	0	0
What vaccine do you prefer?	Covaxin	17	10.42945	14	13.86139	6	60
	covishield	139	85.27607	72	71.28713	2	20
	Sputnik	4	2.453988	11	10.89109	0	0
	Moderna	1	0.613497	3	2.970297	0	0
	Johnson and Johnson	0	0	0	0	0	0
From which source you came to know about the covid-19 vaccine information	News paper	72	44.17178	40	39.60396	4	40
	Medical professionals	38	23.31288	28	27.72277	3	30
	Social media	105	64.41718	61	60.39604	6	60
	Friends and family	55	33.74233	27	26.73267	6	60
	tv	73	44.78528	41	40.59406	4	40

CONCLUSION:

The study concludes that adverse drug reaction of covid-19 vaccination reported that mild to moderate symptoms (fever, myalgia, pain at injection site, body pain). Some of them have experienced symptoms like dry cough (under medication for 1 month), menstrual irregularity, increased blood pressure, right-hand pain, alopecia(rare). No serious adverse drug reaction was reported. The pregnant women and lactating women who have experienced Adverse drug reactions of the covid-19 vaccine were mild to moderate levels of pain at the injection site, fever, body pain, fatigue, vomiting, and hypogalactoria. Due to more potential risks and benefits of the covid vaccine, pregnant and lactating women should consult with their physician before taking the vaccine. In lactating mother need more attention because the baby has experienced adverse drug reaction of the covid-19 vaccine was diarrhea (major) and vomiting(minor). Based on an online survey about awareness of covid 19 vaccination, the majority of participants have aware of covid 19 vaccination. In our study, when compared to males, females are more aware of covid-19 vaccination. Some of the participants are not get vaccinated due to the insufficient clinical trial data, fear of the side effects, and worry about the safety of the covid-19 vaccination. When compare to undergraduate, the postgraduate participant has adequate knowledge about covid-19 vaccination. So need to provide continuous education and training to improve the acceptance of public vaccines and decrease vaccine hesitancy. To avoid vaccine hesitancy among the rural public, provide continuous campaigns, vaccination education programs, and promotion of trust by the local health authorities.

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