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A Cross-Sectional Study to Identify Factors for Vaccination Uptake Amongst University Staff and Students in Northern Ireland

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Abstract: With the increased uptake of the COVID-19 vaccination in 2021, universities resumed face-to-face classes and clinical placements. However, even with incentives, some individuals chose not to receive a vaccination due to personal beliefs and other reasons. Understanding motivations for vaccination uptake or vaccine hesitancy is important to help develop future public health strategies. Therefore, a cross-sectional online survey was carried out among students and staff in a UK university to assess the level of vaccination and explore their views on the acceptability of incentives that may encourage uptake. Almost three quarters (74.4%) of the sample had received at least one dose of a COVID-19 vaccine with a higher proportion of staff receiving a vaccine compared to students (80.0% vs. 70.6%, $p < 0.001$). Vaccine hesitancy or refusal was due to the perceived lack of research and knowledge of the potential long-term effects at the time of vaccination, religious, personal and ethical beliefs and feeling like vaccinations should not be used to restrict social events, travel and medical challenges. This study shows that university staff and students had a relatively high uptake of the COVID-19 vaccination. However, the findings indicate that nearly 20 percent were unsure or unwilling to take the vaccination, therefore suggesting that clearer information and motivational strategies are needed to support the roll out of new vaccines.

Keywords: COVID-19; vaccine hesitancy; university students; vaccine motivations

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1. Introduction

In March 2020, the World Health Organisation declared COVID-19 a global pandemic. As of 29 March 2023, there have been over 758 million cases of COVID-19 globally, resulting in over six million deaths [1]. To address the spread of COVID-19, prosocial behaviours, including social distancing, mask wearing and the uptake of vaccinations were encouraged, and at times legally enforced [2]. The worldwide effort to produce vaccines to prevent infection has led to the development of 20 vaccines [3], of which 4 have been licenced for use in the United Kingdom (UK). In the first year after the first vaccine was administered in the UK, over 51 million people had received at least one dose of the vaccine [4].

Vaccinations are a cost-efficient health measure to prevent disease spread. Mass vaccination programmes have proved successful in the past against infection diseases such as measles, rubella and influenza and led to the eradication of smallpox. Although vaccines can provide significant health benefits, some groups remain sceptical over their use, citing reasons such as accessibility and cost, low perceived personal risk, lack of trust in health authorities and vaccines, concerns about the safety and efficacy of a new vaccine, and a lack of information about vaccines [5]. Over the course of the COVID-19 vaccination programme, young adults, including university students, have been among the least likely to take up the offer of vaccination. For example, a study in 735 Italian university students reported more than 1 in 10 students had low intentions of taking the vaccine when provided

the opportunity [6]. Reasons reported for COVID-19 vaccine hesitancy in this group are similar to those of other population groups, and include a lack of trust in the government and a lack of knowledge regarding vaccine eligibility and concerns about vaccine safety [7].

In response, behavioural science has been used to design a variety of strategies to encourage COVID-19 vaccine uptake. These have included adapting public health messaging and utilising pro-social incentives to reinforce the benefits of vaccination to friends and family. Various forms of financial and non-financial incentives have also been trialled. For example, in the USA, lotteries whereby individuals who are vaccinated could win up to USD 1 million have been used to encourage uptake [8]. Some countries have also introduced a COVID-19 certification scheme, where citizens were required to show proof of vaccination to gain entry to public indoor venues such as bars, restaurants and cinemas and for travel [9]. In young people, university students have reported that resuming face-to-face classes and clinical placements along with returning to normal life were incentives for receiving the COVID-19 vaccination [7]. It has been noted that further research is required on vaccine hesitancy and on strategies to promote vaccine uptake [2,5]. The aim of this study was therefore to assess the level of vaccination in a group of university students and staff and explore their views on the acceptability of incentives that may encourage uptake.

2. Materials and Methods

2.1. Survey

In September 2021, an anonymous online survey was issued using Microsoft Forms to all staff and students (approximately 27,000) at Ulster University by the University Marketing Department. The invitation was resent twice over the following one-month period. For context, in Northern Ireland, by September 2021, hospitals continued to face extreme pressures advising the public to stay away unless a medical emergency, a number of rule changes were implemented such as increased numbers allowed for indoor domestic gatherings, pop-up vaccination centres opened in music venues, while walk-in vaccination centres were established at university and further education colleges across the country; however, outbreaks of COVID-19 were still ongoing, especially in schools and hospitals.

The aim of the survey was to measure the proportion of staff and students who had been vaccinated, examine their perceptions of vaccines, and explore views on the usefulness of various incentives that could be used to encourage uptake. Respondents were asked to identify whether they were a staff member or a student. Demographic information included age group (18–24 years, 25–34 years, 34–44 years, 45–54 years, 55–64 years or 65+ years) and gender (male, female, other, prefer not to say). Vaccination status was assessed as having received either one or two doses of a COVID-19 vaccination.

Those who had not received at least one dose of the vaccine were asked to indicate their reasons for not taking up the vaccine. Individuals were asked to identify which of the following were reasons for not being vaccinated: has not being convenient for me to get vaccinated; have antibodies from contracting COVID-19; worried about the potential side effects; I have been medically advised not to due to possible contraindications; I do not believe COVID-19 is a serious illness; prefer not to say, or other.

In relation to vaccine hesitancy, individuals were asked to express their opinion on vaccines from a list of possible reasons identified from the previous literature [10–16]. Respondents were asked to indicate whether they agreed, neither agreed or disagreed, disagreed or would prefer not to say in response to the following statements: I am hesitant about vaccines generally; I have had a bad experience with vaccinations in the past; I have a fear of needles; I believe vaccines will not be effective on new strains of the virus; I believe the worst of the COVID-19 pandemic has passed, and restrictions will continue to ease; my religious beliefs do not allow me to get vaccinated; I believe herd immunity from other people having antibodies/vaccinations will inhibit the virus; in my opinion, Coronavirus vaccines were rushed/untested; in my opinion, young people are low-risk/unlikely to get very ill with Coronavirus; no one I know has been vaccinated; I have moral/ethical

objections to vaccination; I believe an alternative treatment will be developed, e.g., tablet, inhaler; I may get vaccinated in the future, but not at this stage.

A range of possible incentives to getting the COVID-19 vaccine were presented and individuals were asked to identify whether these incentives would make them receive the vaccine much more likely, more likely, the same, less likely, much less likely or prefer not to say. These incentives included the possibility of the presence of clusters of COVID at the university causing disruption to teaching or assessment or the requirement for certain industry placements; vaccine requirement for access to classes in person, for entry to university bars, sports, library or entertainment facilities, for access to university accommodation; to attend any bars, nightclubs, festivals, etc., outside the university, to study certain subjects/modules (e.g., involving contact with vulnerable people). Finally, an open-ended question was asked regarding enquiring about other circumstances or incentives that would encourage the respondents to have COVID-19 vaccination.

2.2. Statistical Analysis

Descriptive statistics were used to summarise the proportion of responses to role in the university, age group and gender. In addition to descriptive statistics, the characteristics of respondents who had or had not received at least one dose of the vaccine was compared using chi-squared tests, overall and separately for staff and students. The reasons for not taking up the vaccine and views on incentives were only examined for those who had not received at least one dose of the vaccine. Similar to above, the characteristics of respondents were compared using chi-squared tests, overall and separately for staff and students.

Finally, the open-ended responses were thematically analysed by two independent researchers (EM and MAT) according to the method of Braun and Clarke [17]. Firstly, responses were read through to gain familiarity with the data. After this, initial codes were generated, and then grouped into themes. These themes were then reviewed by the authors before being finalised.

3. Results

Results are reported both quantitatively and qualitatively through descriptive statistics and themes uncovered in thematic analysis.

3.1. Participant Characteristics

Overall, 3994 individuals responded to the survey. Of these, 1631 (41.5%) were staff and 2300 were students (58.5%). The majority of respondents were female (n = 2645, 66.2%) and between 18 and 24 years of age (n = 1535, 38.4%).

3.2. Vaccination Status

Almost three quarters (n = 2966, 74.4%) of the sample had received at least one dose of a COVID-19 vaccine (Table 1). A higher proportion of staff had received a vaccine compared to students (80.0% vs. 70.6%, $p < 0.001$). Similarly, older individuals were more likely to have received a vaccine (in older respondents compared to younger ones, $p < 0.001$). No difference was observed between males and females ($p = 0.61$). Amongst staff only, vaccine uptake increased with age ($p > 0.001$), but no differences were observed by gender (Table 1). By contrast, in students, a higher proportion of females received at least one dose of the vaccine compared to males (71.4% vs. 68.6%, $p = 0.07$), with no age-related differences observed ($p = 0.30$).

Table 1. Comparison of the characteristics of individuals who have or have not received a vaccination.

Have You Received at Least One Dose of a COVID-19 Vaccine?							
	Yes		No		Prefer not to say		
	N	%	N	%	N	%	*p*-value
			Overall (n = 3658)				
All	2966	74.4	814	20.4	208	5.2	-
			Role				
Staff (n = 1361)	1304	80.0	250	15.3	77	4.7	<0.001
Students (n = 2297)	1623	70.6	546	23.7	128	5.6	
			Gender				
Males	939	73.2	268	20.9	75	5.9	0.27 *
Females	1985	75.1	533	20.2	126	4.8	
Other/Prefer not to say	38	67.9	11	19.6	7	12.5	
			Age				
18–24	1072	69.9	385	25.1	77	5.0	
25–34	404	70.6	134	23.4	34	5.9	<0.001
35–44	474	75.1	120	19.0	37	5.9	
45–54	594	79.7	113	15.2	38	5.1	
55+ years	421	83.9	59	11.8	22	4.4	
			Staff (n = 1361)				
All	1304	80	250	15.3	77	4.7	-
			Gender				
Males	437	79.7	88	16.1	23	4.2	0.61 *
Females	855	80.6	154	14.5	52	4.9	
Other/Prefer not to say	12	17.1	7	33.3	2	9.5	
			Age				
18–24	31	63.3	18	36.7	0	0.0	
25–34	117	73.1	38	23.8	5	3.1	<0.001
35–44	300	79.2	57	15.0	22	5.8	
45–54	482	80.6	86	14.4	30	5.0	
55+ years	373	84	51	11.5	20	4.5	
			Students (n = 2297)				
All	1623	70.6	546	23.7	128	5.6	-
			Gender				
Males	498	68.6	177	24.4	51	7.0	0.07
Females	1095	71.4	365	23.8	73	4.8	
Other/Prefer not to say	26	76.5	4	11.8	4	11.8	
			Age				
18–24	1010	70.1	356	24.7	75	5.2	
25–34	283	70.0	93	23.0	28	6.9	0.30
35–44	173	69.2	62	24.8	15	6.0	
45–54	111	76.0	27	18.5	8	5.5	
55+ years	-	-	-	-	-	-	

* limited to males vs. females due to small numbers who selected other or prefer not to say.

3.3. Reasons for Not Getting Vaccinated

In those who had not received a vaccine (n = 305), the main reasons reported for not getting a vaccine were that they were hesitant about COVID-19 vaccines specifically (80.8%), believed COVID-19 vaccines were rushed or untested (73.3%), or believed that young people are at low risk of becoming ill (56.7%). Approximately half of all respondents, however, reported that they may still get a vaccine at some future stage (50.8%) (Table 2). Comparing responses between staff and students, a significantly higher proportion of students reported a needle phobia as a reason for not getting vaccinated (20.4% vs. 5.7%,

$p = 0.01$) (Table 2). A significantly higher proportion of students disagreed that they were waiting on alternative treatments than staff (38.6% vs. 11.1%, $p = 0.001$). Conversely, a higher proportion of staff reported that their religious beliefs were a reason for not getting vaccinated (9.3% vs. 5%, $p = 0.03$). Due to small sample sizes, it was not possible to analyse the data separately for staff and students. Comparing males and females in the overall sample, a significantly higher proportion of females reported that they disagreed that their religious beliefs were a reason for not getting vaccinated (84.4% vs. 64.9%, $p = 0.001$).

Table 2. Reasons for not getting vaccinated.

		Agree	Neither Agree Nor Disagree	Disagree	Prefer Not to Say	
		n (%)	n (%)	n (%)	n (%)	*p*-Value
Hesitant about vaccines generally	Overall	62 (20.5)	77 (25.5)	159 (52.6)	4 (1.3)	
	Staff	16 (18.6)	11 (26.9)	27 (53.7)	0 (0)	0.27
	Students	45 (20.6)	65 (25.7)	160 (53.0)	2 (0.7)	
	Male	18 (16.4)	32 (29.1)	59 (53.6)	1 (0.9)	0.5
	Female	43 (23.0)	44 (23.5)	98 (52.4)	2 (1.1)	
Hesitant about COVID-19 vaccines specifically	Overall	244 (80.8)	31 (10.3)	22 (7.3)	5 (1.7)	
	Staff	45 (83.3)	6 (11.1)	3 (5.6)	0 (0.0)	0.78
	Students	196 (81.0)	24 (9.9)	19 (7.9)	3 (1.2)	
	Male	89 (80.2)	8 (7.2)	12 (10.8)	2 (1.8)	0.19
	Female	151 (81.2)	23 (12.4)	10 (5.4)	2 (1.1)	
Bad experience with vaccinations in the past	Overall	49 (16.3)	49 (16.3)	199 (66.3)	3 (1)	
	Staff	9 (17.0)	12 (22.6)	31 (58.5)	1 (1.9)	0.31
	Students	40 (16.6)	36 (14.9)	164 (68.0)	1 (0.4)	
	Male	15 (13.6)	14 (12.7)	80 (72.7)	1 (0.9)	0.33
	Female	34 (18.4)	34 (18.4)	116 (62.7)	1 (0.5)	
Fear of needles	Overall	52 (17)	38 (12.5)	209 (67.5)	3 (1)	
	Staff	3 (5.7)	8 (15.1)	41 (77.4)	1 (1.9)	0.01
	Students	49 (20.4)	30 (12.5)	161 (67.1)	0 (0)	
	Male	13 (11.9)	14 (12.8)	81 (74.3)	1 (0.9)	0.26
	Female	39 (21.1)	22 (11.9)	123 (66.5)	1 (0.5)	
I believe vaccines will not be effective on new strains of the virus	Overall	117 (38.7)	178 (58.9)	1 (0.3)	6 (2.0)	
	Staff	17 (31.5)	37 (68.5)	0 (0)	0 (0)	0.38
	Students	99 (40.9)	138 (57.0)	1 (0.4)	4 (1.7)	
	Male	43 (38.7)	65 (58.6)	0 (0)	3 (2.7)	0.64
	Female	73 (39.2)	110 (59.1)	1 (0.5)	2 (1.1)	
I believe the worst of the COVID-19 pandemic has passed, and restrictions will continue to ease	Overall	97 (32.4)	111 (37.1)	83 (27.8)	8 (2.7)	
	Staff	16 (29.6)	21 (38.9)	15 (27.8)	2 (3.7)	0.77
	Students	80 (33.5)	89 (37.2)	66 (27.6)	4 (1.7)	
	Male	41 (37.3)	44 (40.0)	22 (20.0)	3 (2.7)	0.14
	Female	55 (29.9)	65 (35.3)	60 (32.6)	4 (2.2)	
My religious beliefs do not allow me to get vaccinated	Overall	18 (6)	43 (14.2)	232 (76.8)	9 (3)	
	Staff	5 (9.3)	13 (24.1)	36 (66.7)	0 (0)	0.03
	Students	12 (5)	29 (12)	193 (79.8)	8 (3.2)	
	Male	11 (9.9)	23 (20.7)	72 (64.9)	5 (4.5)	0.001
	Female	7 (3.8)	20 (10.8)	157 (84.4)	2 (1.1)	
I believe herd immunity from other people having antibodies/vaccinations will inhibit the virus	Overall	91 (30.3)	139 (46.3)	60 (20)	10 (3.3)	
	Staff	20 (37)	27 (50)	6 (11.1)	1 (1.9)	0.28
	Students	70 (29.2)	110 (45.8)	52 (21.7)	8 (3.3)	
	Male	39 (35.5)	46 (41.8)	21 (19.1)	4 (3.6)	0.42
	Female	50 (27)	92 (49.7)	38 (20.5)	5 (2.7)	

Table 2. *Cont.*

		Agree	Neither Agree Nor Disagree	Disagree	Prefer Not to Say	
		n (%)	n (%)	n (%)	n (%)	*p*-Value
In my opinion, Coronavirus vaccines were rushed/untested	Overall	222 (73.3)	51 (16.8)	27 (8.9)	3 (1)	
	Staff	42 (76.4)	11 (20.0)	2 (3.6)	0 (0)	0.39
	Students	178 (73.6)	38 (15.7)	25 (10.3)	1 (0.4)	
	Male	80 (71.4)	20 (17.9)	12 (10.7)	0 (0)	0.6
	Female	218 (74.2)	51 (16.7)	27 (8.1)	2 (1.1)	
In my opinion young people are low-risk/unlikely to get very ill with Coronavirus	Overall	170 (56.7)	64 (21.3)	59 (19.7)	7 (2.3)	
	Staff	29 (54.7)	16 (30.2)	7 (13.2)	1 (1.9)	0.33
	Students	139 (57.7)	48 (19.9)	50 (20.7)	4 (1.7)	
	Male	70 (63.6)	24 (21.8)	13 (11.8)	3 (2.7)	0.05
	Female	97 (56.4)	40 (21.6)	46 (19.9)	3 (2.0)	
No one I know has been vaccinated	Overall	11 (3.7)	32 (10.6)	251 (83.4)	7 (2.3)	
	Staff	2 (3.7%)	5 (9.3)	46 (85.2)	1 (1.9)	0.98
	Students	8 (3.3)	27 (11.2)	202 (83.8)	4 (1.7)	
	Male	4 (3.6)	10 (9.1)	96 (87.3)	0 (0)	0.3
	Female	7 (3.8)	22 (11.8)	152 (81.7)	5 (2.7)	
I have moral/ethical objections to vaccination	Overall	71 (23.7)	66 (22.0)	155 (51.7)	8 (2.7)	
	Staff	16 (29.6)	9 (16.7)	28 (51.9)	1 (1.9)	0.59
	Students	54 (22.5)	56 (23.3)	124 (51.7)	6 (2.5)	
	Male	34 (30.6)	25 (22.5)	50 (45.0)	2 (1.8)	0.11
	Female	35 (19.0)	40 (21.7)	104 (56.5)	5 (2.7)	
I believe an alternative treatment will be developed	Overall	54 (17.9)	141 (46.8)	101 (33.6)	5 (1.7)	
	Staff	11 (20.4)	37 (68.5)	6 (11.1)	0 (0)	0.001
	Students	42 (17.4)	103 (42.7)	93 (38.6)	3 (1.2)	
	Male	27 (24.5)	53 (48.2)	28 (25.5)	2 (1.8)	0.04
	Female	26 (14%)	87 (46.8)	71 (38.2)	2 (1.1)	
I may get vaccinated in the future but not at this stage	Overall	155 (50.8)	68 (22.3)	70 (23)	9 (3)	
	Staff	30 (54.5)	13 (23.6)	12 (21.8)	0 (0)	0.62
	Students	123 (51.0)	54 (22.4)	57 (23.7)	7 (2.9)	
	Male	58 (52.7)	21 (19.1)	27 (24.5)	4 (3.6)	0.63
	Female	96 (51.3)	46 (24.6)	41 (21.9)	4 (2.1)	

3.4. Incentives to Get Vaccinated

Across the whole sample, the incentives cited as more likely to increase vaccination uptake were if it was required to study certain subjects/modules (19.8%); was required for attending any bars, nightclubs, festivals, etc., outside the university (15.2%); clusters of COVID-19 occurred at the university, causing disruption to teaching or assessment (19%); or it was required for access to in-person/on-campus classes (12.7%) (Table 3). Comparing staff and students, a significantly higher proportion of students reported factors relating to attendance at university as incentives, including if it was required for certain industry placements (22.9% vs. 5.6%, $p < 0.001$); access to in-person/on-campus classes (18.3% vs. 1.9%, $p = 0.001$); for university bars, sports, library or entertainment facilities (15.1% vs. 0%, $p = 0.009$); or to study certain subjects/modules (23.1% vs. 3.7%, $p = 0.002$). A higher proportion of students also said they would be more likely to get vaccinated if it was required for attending any bars, nightclubs, festivals, etc., outside the university (18.1% vs. 0%, $p = 0.002$). The sample size of groups by age is very small and therefore prohibited statistical analyses.

Comparing males and females across the sample, a significantly higher proportion of males identified the requirement of a COVID-19 vaccine to access university bars, sports, library or entertainment facilities as an incentive (16.4% vs. 10.9%, $p = 0.04$), whereas a higher proportion of females than males reported that a requirement to study certain

subjects or modules would be less likely to incentivise vaccination (28.8% vs. 31.2%, $p = 0.001$).

Table 3. Incentives to receiving a COVID-19 vaccine.

		Likelihood of Receiving Vaccine *								
		Much More or More Likely		**The Same**		**Less Likely of Very Less Likely**		**Prefer Not to Say/Not Applicable**		**Chi-Square *p*-Value**
		n	%	n	%	n	%	n	%	
Clusters of COVID occurred at the university causing disruption to teaching or assessment	Overall	57	19	154	51.3	62	20.3	27	8.9	
	Role									
	Staff	7	13	27	50	12	22.2	8	14.8	0.25
	Students	49	20.4	125	52.1	48	20	18	7.5	
	Gender									
	Males	23	20.9	53	48.2	22	20	12	10.9	0.50 *
	Females	34	18.4	100	54.1	39	21.1	12	6.5	
It was required for certain industry placements	Overall	47	15.6	112	37.2%	113	37.5	29	9.6	
	Role									
	Staff	3	5.6	14	25.9	21	38.90	16	29.6	<0.001
	Students	54	22.9	85	36.0	75	31.80	22	9.3	
	Gender									
	Males	17	15.7	34	31.5	44	40.7	13	12.0	0.14
	Females	41	22.5	65	35.7	51	28.0	25	13.7	
It was required for access to in-person/on-campus classes	Overall	38	12.7	111	37.1%	123	41.1	27	9%	
	Role									
	Staff	1	1.9	21	38.9	21	38.9	11	20.4	0.001
	Students	44	18.3	90	37.3	90	37.3	17	7.1	
	Gender									
	Males	21	18.9	31	27.9	48	43.2	11	9.9	0.07
	Females	26	14.1	80	43.2	63	34.1	16	8.6	
It was required for university bars, sports, library or entertainment facilities	Overall	2	9.8	94	31.6	111	37.4	63	21.2	
	Role									
	Staff	0	0.0	24	44.4	22	40.7	8	14.8	0.009
	Students	36	15.1	86	36.0	99	41.4	18	7.5	
	Gender									
	Males	18	16.4	30	27.3	51	46.4	11	10.0	0.04
	Females	20	10.9	80	43.5	70	38.0	14	7.6	
It was required for attending any bars, nightclubs, festivals, etc., outside the university	Overall	45	15.2	107	36%	122	41.1	23	7.7%	
	Role									
	Staff	0	0.0	27	50.0	21	38.9	6	11.1	0.002
	Students	43	18.1	79	33.3	99	41.8	16	6.8	
	Gender									
	Males	19	17.4	30	27.5	52	47.7	8	7.3	0.11
	Females	26	14.2	76	41.5	68	37.2	13	7.10	
It was required to study certain subjects/modules (e.g., involving contact with vulnerable people)	Overall	59	19.8	111	37.2%	89	29.9	39	13.1	
	Role									
	Staff	2	3.7	23	42.6	16	29.6	13	24.10	0.002
	Students	55	23.1	87	36.6	71	29.8	25	10.50	
	Gender									
	Males	24	22.0	36	33.0	34	31.2	15	13.80	0.001
	Females	35	19.0	74	40.2	53	28.8	22	12.00	

* limited to males vs. females due to small numbers who selected other or prefer not to say.

3.5. Views on Other Incentives

Overall, 1906 open-ended responses were received to the question on other incentives, of which 224 were not related to the question.

3.6. Results: Themes for Open Text Responses

Open text responses were grouped around the motivations to be vaccinated. Overall, 1535 responses were coded into the following themes; (1) Health promotion, (2) Return to "normal" life, (3) Better communication pathways, (4) Other.

3.6.1. Theme 1: Health Protection

Over one third of the open-ended responses identified the health of others as sufficient incentive to receive the vaccine. Some commented that the health of the general public was a strong incentive to taking up the vaccine.

> "Watching 130,000 people in the UK die from this disease was enough. I'm not sure I need another incentive".

For others, the incentive was more personal. Protection of family, particularly those with an underlying vulnerability, or their own health was identified.

> "Protecting my vulnerable family members";
>
> "If I contract COVID-19, I know my case would be milder than some others because of double vaccination";
>
> "Personally, I got the COVID-19 vaccine because I wanted to feel save and protected as much as possible when started university and have the freedom to socialize and travel".

One person also noted that they were concerned about possible adverse reactions to vaccines, and suggested that if there was some screening in place, it might encourage more people to get vaccinated:

> "I strongly believe that everyone should be tested for any allergic reactions to vaccine components prior the vaccination".

3.6.2. Theme 2: Returning to "Normal Life"

The desire to return to "normal" (pre-COVID-19) lifestyles was also frequently commented on as an incentive for vaccination. Responses included emphasis on the ability to travel freely, return to their daily activities and the removal of restrictions would make the respondents more inclined to receive the Coronavirus vaccine.

> "Being able to travel, go to venues, the idea that this will open up our lives again to almost pre-pandemic";
>
> "For me, the incentive has always been to get back to life as normal and be able to enjoy my studying fully".

On the contrary, a large sum of responses suggested that if there was an increase in restrictions directly aimed at the unvaccinated population, it would entice those individuals to receive the vaccine due to the increased difficulty it causes in their daily life. Some suggested if "a vaccine passport or vaccine card was mandatory in every and all public buildings no matter the size" it would act as an incentive. Meanwhile, others proposed lockdown measures: "Imposing a lighter lockdown for those without a vaccine might be extreme but necessary if the uptake isn't good enough".

3.6.3. Theme 3: Material Incentives and Accessibility

There were some suggestions that the use of material incentives would be beneficial. This included financial payment or reward schemes such as free entry into movie theatres, free concert tickets or discounts. Interestingly, one response recommended: "If double

vaccinated, reward schemes such as loyalty points on local shops for students could be useful". While the effectiveness of materialistic incentives was the view of some, others believed that solely the opportunity to return to campus, to face-to-face education, would increase a person's likelihood of getting vaccinated: "The guarantee that we would get to be back on campus full time". Similarly, suggestions were put forward for a public campaign across Ulster community to encourage staff and students as well as mobile vaccination clinics on site. This view links in with another theme of increased vaccine accessibility. Some survey responders reported they would be more inclined to receive the COVID-19 vaccine in "pop-up vaccination clinics in spaces accessible to younger people who may not be able to drive/have their own car".

3.6.4. Theme 4: Better Communication Pathways for Information

A reoccurring theme regarding clear communication and a call for more long-term research to be conducted was determined. Responses urged for more transparency on the development of vaccines and its effects (if any) on fertility issues. Some suggested Coronavirus updates should be stemmed away from government figures and instead presented by healthcare professionals or indeed peers to decrease the involvement of politics and increase the likelihood of vaccine reception.

> "More information and transparency on how the vaccines have been developed. There seems to be many categories of anti-vaccers, ranging from conspiracy theories to people who are genuinely worried that vaccines may have long-term currently unknown side effects. Government and medics need to have an informed information campaign rather than just 'get vaccinated' message".

Others suggested a positive approach was necessary from the government, namely, instead of including the number of deaths caused by the virus, presenting figures of the number of individuals saved by the vaccine.

> "Keep providing ongoing evidence of deaths being reduced from those who are double jabbed, so the younger population feel more confident in coming forward";
>
> "Having a healthcare professional evaluate the pros and cons of receiving the vaccine".

3.6.5. Theme 5: Non-Incentives/Possible Consequences

Some responses to the open-ended question did not necessarily fall under the category of incentives and therefore were included under a theme of their own. These responses indicated that vaccines should be mandatory, and the unvaccinated population should be treated differently such as waiving their right to healthcare treatments:

> "I believe you shouldn't be prioritized in hospital ICU or other departments if you have chosen not to receive the vaccine";
>
> "Mandatory vaccine for those not vaccinated".

Others commented that those that are not vaccinated impact the vaccination population and therefore should be refused entry into education premises or public and social premises:

> "Refusal to enter university premises, refusal to provide access to services in university, and proof of double vaccination for pubs and restaurants".
>
> "Those who are not vaccinated should not be allowed to access the university. We must be very strict with the no-vax people".

Another individual thought that "if it was less forced", then maybe more individuals would uptake the vaccination, whereas the push on individuals to uptake the vaccination and incentives for the vaccination may actually have an impact on the numbers of those getting vaccinated. Although these findings are unethical and do not represent incentives,

it would be biased to not include them in the findings as they represent a percentage of what some individuals are thinking.

3.7. Reasons for Not Receiving Vaccination

3.7.1. Theme 1: Beliefs

A number of reasons for not getting the Coronavirus vaccination were discussed in the open text responses. Over half the responses were other beliefs, including personal family reasons, religious/moral beliefs, not believing a vaccine was needed and, finally, some had not had the chance to receive vaccination yet. Those who had not yet received the vaccine noted that they had had COVID and would be waiting until they were allowed to receive the vaccine. Personal reasons included the belief that it would impact their lives or their family did not want them to get it. A number of respondents felt that they had natural immunity, were healthy or were too young to need the vaccination.

> "I believe my own immune system is a better way to fight it off, given that I am a healthy, fit person and have not needed flu vaccines I have no need for this. I do not believe it is as big a threat as has been made out";
>
> "As a healthy young person, it is statistically proven that the vaccine is more likely to cause me harm than the virus is. Also, you can carry the virus regardless of whether or not you're vaccinated so for me to be vaccinated would not impact anyone else's safety. These two points together are the reasons I will not be vaccinated".

Others felt there were moral and ethical issues surrounding the vaccination creation and therefore they would not be getting vaccinated due to these beliefs; some felt that the vaccination promotion was medical discrimination.

> "I have moral and ethical objections to the use of foetal cell lines in the testing, development and/or production phases of the COVID-19 vaccines";
>
> "The creation of a two-tiered society that believes in relinquishing the freedoms of those that cannot or will not take it, thereby enforcing medical discrimination".

3.7.2. Theme 2: Health Impact and Long-Term Effects

Health concerns and the long-term effects of receiving the COVID-19 vaccination were discussed by a majority of those not yet vaccinated. Many respondents discussed that the potential long-term effects of the vaccination are not yet known and therefore more trials are required before they would even consider this.

> "The vaccine trial does not conclude until the end of 2023. I am not comfortable with taking part in this global trial. People who are getting vaccinated are still contracting the virus and spreading it, while we do not fully understand lasting effects. I'll wait";
>
> "Longer/long-term evidence for the effectiveness and efficacy of the vaccine is not available, and therefore there is lack of evidence base to make a decision. Such an evidence base would provide data relating to any possible negative consequences to future health or drug incompatibility with future necessary drugs and the impact of vaccination on the rate and extent of possible mutations of the Coronavirus for all members of society".

Those respondents who were pregnant or considering pregnancy were worried about side effects or future issues conceiving.

> "Worried about long-term effects, fertility, cycle changes and wonder why they are bribing young people to get it so much—never pushed a vaccine so much before";
>
> "Was pregnant and currently breastfeeding. Unsure of possible affects in newborn";

> "Several respondents had possible Trypanophobia which is a severe fear of needles or injections, therefore they had not been able to get the vaccine as of yet";
>
> "Have a severe phobia of needles, trying to get over it though".

Others cited current medication circumstances as reasons for exemption with not enough known on the impact it would have on their current conditions as testing had not yet been conducted in these groups, therefore they felt the risk was not worth it.

> "Multiple health conditions with different consultants giving different opinions. The consultant over the auto immune conditions said it's new, we don't know if it's good for you but it's good for the pandemic. Based on this I've opted not to get it";
>
> "Has not been thoroughly tested on people with my medical condition and therefore the effects are unknown—I'm immunosuppressed. Serious blood clotting issues run in our family—I have concerns about how the vaccine was developed".

3.7.3. Theme 3: Risks Outweigh the Benefits

Linked with the previous theme, a number of respondents felt that the risks of not receiving the vaccination outweighed any potential benefits commenting that people contracted COVID-19 and were perfectly fine while people they knew that received the vaccination suffered from side effects and developed medical conditions involving blood clots.

> "Vaccinations were marketed to us as being between 80 and 95% effective against transmission but this has proved to be grossly false. Vaccinations are ineffective and the risks outweigh the benefits";
>
> "I have weighed up positives and negatives and don't see any potential benefit or incentive from receiving a vaccine. I'm 90% sure I've already had COVID-19 and am not concerned about catching it again as I didn't take it too bad; however, vaccines always pose an element of risk, which the benefits do not currently outweigh";
>
> "The COVID-19 vaccines are still in their experimental stages with unknown long-term effects. Therefore, as I am not considered 'at risk' and there being a very small probability of becoming seriously ill, through risk benefit analysis, I have chosen not to take it immediately".

3.8. Other Circumstances or Incentives

Participants were asked "What other circumstances or incentives would encourage you to have COVID-19 vaccination?" Out of the 305 respondents who did not uptake the vaccination, 218 responded to this question. It must be noted that a number of participants (n = 133) who had not received a vaccination believed that no incentives should be offered and that they should not be punished with any restrictions if they chose not to get vaccinated. The responses noted that many were angry at the thought of these incentives and felt they were a "bribe" or an ineffective approach as individuals had a right to make their own personal choice.

> "There are no incentives or circumstances that would encourage me to have the COVID-19 vaccination. I value my health and time above everything else and I am content with my own decisions with an open-mindedness to be proven wrong";
>
> "Nothing will incentivise me to personally take the vaccine. I don't agree with mandatory vaccine passports—it should be a personal choice and to enforce this onto students and staff would be morally wrong. I will consider taking the vaccine as more time passes and knowledge is available on the vaccine and its effectiveness";

> "There shouldn't be any incentive or circumstances to encourage people to get the vaccine as this is a form of coercion. Everyone should be given all the facts about the vaccines and left to decide for themselves if they want to get it. This decision should not be influenced by anyone and there should be no pressure on anyone to get it if they decide against it or decide to wait";
>
> "No circumstances or incentives would encourage me to have a COVID-19 vaccination, in fact any 'incentives' would be coercion/blackmail and therefore I would be even less likely to get it".

The remaining responses to this open text question indicated that it was not an increase in incentives but a change in circumstances such as trials and future more detailed research that would influence the respondents' decisions.

> "Vaccinations to be fully tested and trialled to ensure no side effects in the long term. I feel the vaccination programme has been brought out very quick and heavily encouraged when significant research is still to be done to see if it is effective and completely safe";
>
> "Full reassurance and research regarding the impact of fertility and related disabilities for future unborn children regarding COVID-19";
>
> "I would like to be able to know for sure what the vaccine may do in the future or for fertility. I want to get the vaccine but I'm scared that horrendous side effects happen in some years to come so I want to wait it out and see. I had COVID-19 and I don't want to go through it again but the uncertainty is what stops me, unfortunately".

While many did not think specific circumstances or incentives should apply, several felt that remote learning would be beneficial as they would feel safer, while others thought that free items or easier access would make them more likely to receive a vaccination.

> "Option of remote learning. I intend to be vaccinated; however, I am concerned about my young family with a 3-year-old and newborn and that the vaccine does not necessarily protect you from contracting COVID-19. The university cannot guarantee every student or member of staff to be vaccinated and spread of the virus may still occur";
>
> "Not being forced into crowds including face-to-face learning";
>
> "If the right incentive was offered such as a free car, holiday, tuition fee waiver, or student loan cancellation, I would gladly accept a vaccine as that would then provide an actual benefit for a young person receiving a vaccine which would then outweigh any potential risks".

4. Discussion

This study is the first study in Northern Ireland to report solely on the perceptions of university staff and students regarding COVID-19 vaccination uptake. This study assessed the level of vaccination in a group of university students and staff and explored their views on the acceptability of incentives that may encourage uptake. It adds to the current body of the literature surrounding vaccination uptake. As the pandemic continued from 2019 into 2021, attitudes towards vaccination uptake began to shift as restrictions were constantly changing. Amongst survey respondents, uptake rate was at 74.4%, suggesting a high level of uptake. These data suggest that a majority of students and staff within the university setting were willing to protect themselves by getting vaccinated. In comparison to the general UK vaccination uptake, which by September 2021 was at 83.8% of those receiving at least one vaccination, this study reports a lower uptake amongst the university population of 74.4%. This figure is only slightly lower than the uptake of 74.8% of the Northern Ireland general population reported by the UK Health Security agency in 2022 (lowest reported in the UK) [4].

In regards to vaccination, 20.4% of the overall sample in this study did not receive the COVID-19 vaccination. Students had a higher rate of vaccination hesitancy at 23.7%. A cross-sectional study [7] determined vaccine hesitancy to be low in students (17.1%) in India, which is lower than the figure reported in this study. This could highlight that the vaccination is viewed differently amongst university students in other countries. Meanwhile, an Italian study [18] reported vaccination hesitancy amongst students to be between 22 and 29%, showing some similarities to this study, though the findings are lower than those of a study of students in the United Emirates, which showed that 43.7% did not consider the vaccine important to protect people [19].

The findings highlighted that there was a high level of acceptability for incentives to encourage vaccination uptake. The biggest incentive was related to prosocial behaviour in terms of protecting their own health and the health of others around them. The end of many restrictions and the chance of returning to a more normal life with face-to-face teaching, social events and an opportunity for a safe learning environment where both students and staff were protected was noted as important. Other themes detailed that tangible incentives such as financial payments, free tickets or rewards schemes would be acceptable incentives. Evidence from other research highlighted similarities to these findings. Kluver et al. [20] suggested three strategies (freedoms, financial remuneration and vaccination at local doctors) could increase vaccination uptake, and Fishman et al. [21] also noted less mandates and restrictions alongside the financial incentives. Meanwhile, Shahwan et al. [19] noted that good knowledge and the incentive of knowing that the pharmaceuticals had developed a safe and effective vaccination. Findings also evidenced within this study, the majority considered the vaccination and incentives acceptable.

Amongst the themes discussed within the results, similarities can be detected with other literature, particularly in regard to vaccination hesitancy [7,19]. The qualitative data from the open-ended responses indicated differences in reasons why people decided to get vaccinated. In those unvaccinated, there was low acceptability in the use of incentives to encourage any future uptake of the vaccination. The data suggested that there was mistrust in the health care research, lack of clear evidence and information on the benefit of the vaccination and a distrust in the government. This could be perhaps linked to the current lack of proper government within Northern Ireland, which could be impacting clearer information spread across the country. The lack of government trust, uncertainty of effectives and safety were noted by previous research [7,19]. Research by Baccolini et al. [22] noted that amongst the unvaccinated, there were many links to political debates around vaccinations, particularly in younger adults. This compares to the findings in the study, particularly amongst the students. Similar to the studies by Baccolini et al. [22] and Jain et al. [7], those not vaccinated noted that the risks outweigh any benefits and the findings indicated that many felt freedom of choice was important as they were not in the high-risk category. More information is therefore needed on the amount of knowledge university staff and students have on COVID-19 and the vaccination while also understanding their level of health literacy.

Strengths and Limitations

The mixed methods approach using both questions that could be quantified and qualitative open text responses is a strength of the study. The triangulation of the data strengthens the findings. That said, the addition of focus groups with those vaccinated and those unvaccinated who have provided additional more in-depth data should be explored in future research. The use of an anonymous online survey was a strength as it allowed access to staff and students during a time of remote learning and the new academic semester. The use of the online survey is more convenient to all included participants and they can take their time to complete the survey, which can provide more valid results.

Our response rate of just under 15% for the survey is similar to or higher than those of other vaccination research papers [23,24]. Previous evidence has suggested variability in response rates by surveys emailed out to university populations [25,26]. Higher responses

rates of 30 and 40 have been detected in wider studies in the general population [27,28], suggesting the university population could be hard to reach. A limitation of the use of online surveys is that only individuals who paid attention to the email from the marketing department at the university will have responded and therefore specific groups may have been underrepresented due to their media usage, technological devices or internet access. Therefore, these findings may not be generalisable to the wider population as a whole and may be at risk of selection bias. Cross-sectional surveys can also create a non-response bias and are only reflective of that period of time examined. Therefore, we cannot reveal casual relationships or changes [29,30]. Additionally, the survey was conducted in September 2021, which indicates that we only provide data for that period of the COVID-19 pandemic; overtime, the factors for vaccination uptake have changed, and therefore future research should explore the new scenarios as we enter a different point of the pandemic where the infection rates have lowered and the pathogenicity of the virus may have altered. To minimise possible bias, the survey was resent twice during a one-month period.

5. Conclusions

The COVID-19 pandemic has changed the world and highlighted that clearer information distribution is required surrounding vaccinations. While a majority of individuals receive vaccinations, it is evident that a number of people from the university setting are hesitant. Regrettably, mistrust of the government, differing perceptions of medical research and personal beliefs may hinder public efforts to curb the spread of COVID-19 and reduce hospitalisations. A timely effort is needed to explain the importance of vaccinations with strategies in place to provide clearer, more detailed information backed up by research to help improve perceptions towards the COVID-19 vaccination. Universities may be a good area for possible interventions as they offer a more open and constantly changing learning hub to promote health literacy and therefore should be investigated further.

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References

1. World Health Organisation. Available online: https://covid19.who.int (accessed on 2 March 2023).
2. Motta, M.; Sylvester, S.; Callaghan, T.; Lunz-Trujillo, K. Encouraging COVID-19 vaccine uptake through effective health communication. *Front. Political Sci.* **2021**, *3*, 630133. [CrossRef]
3. World Health Organisation. Available online: https://extranet.who.int/pqweb/sites/default/files/documents/Status_COVID_VAX_20Dec2021.pdf (accessed on 2 March 2023).
4. Gov.uk. Available online: https://coronavirus.data.gov.uk/details/vaccinations (accessed on 2 March 2023).
5. Truong, J.; Bakshi, S.; Wasim, A.; Ahmad, M.; Majid, U. What factors promote vaccine hesitancy or acceptance during pandemics? A systematic review and thematic analysis. *Health Promot. Int.* **2022**, *37*, daab105. [CrossRef]
6. Barello, S.; Nania, T.; Dellafiore, F.; Graffigna, G.; Caruso, R. 'Vaccine hesitancy' among university students in Italy during the COVID-19 pandemic. *Eur. J. Epidemiol.* **2020**, *35*, 781–783. [CrossRef]

7. Jain, J.; Saurabh, S.; Kumar, P.; Verma, M.K.; Goel, A.D.; Gupta, M.K.; Bhardwaj, P.; Raghav, P.R. COVID-19 vaccine hesitancy among medical students in India. *Epidemiol. Infect.* **2021**, *149*, e132. [CrossRef] [PubMed]
8. Acharya, B.; Dhakal, C. Implementation of State Vaccine Incentive Lottery Programs and Uptake of COVID-19 Vaccinations in the United States. *JAMA Netw. Open* **2021**, *4*, e2138238. [CrossRef] [PubMed]
9. Sharun, K.; Tiwari, R.; Dhama, K.; Rabaan, A.A.; Alhumaid, S. COVID-19 vaccination passport: Prospects, scientific feasibility, and ethical concerns. *Hum. Vaccines Immunother.* **2021**, *17*, 4108–4111. [CrossRef]
10. Razai, M.S.; Chaudhry, U.A.R.; Doerholt, K.; Bauld, L.; Majeed, A. COVID-19 vaccination hesitancy. *BMJ* **2021**, *373*, n1138. [CrossRef] [PubMed]
11. Cordina, M.; Lauri, M.A. Attitudes towards COVID-19 vaccination, vaccine hesitancy and intention to take the vaccine. *Pharm. Pract. (Internet)* **2021**, *19*, 2317. [CrossRef]
12. Chevallier, C.; Hacquin, A.S.; Mercier, H. COVID-19 vaccine hesitancy: Shortening the last mile. *Trends Cogn. Sci.* **2021**, *25*, 331–333. [CrossRef]
13. Kessels, R.; Luyten, J.; Tubeuf, S. Willingness to get vaccinated against COVID-19 and attitudes toward vaccination in general. *Vaccine* **2021**, *39*, 4716–4722. [CrossRef]
14. Karlsson, L.C.; Soveri, A.; Lewandowsky, S.; Karlsson, L.; Karlsson, H.; Nolvi, S.; Karukivi, M.; Lindfelt, M.; Antfolk, J. Fearing the disease or the vaccine: The case of COVID-19. *Personal. Individ. Differ.* **2021**, *172*, 110590. [CrossRef] [PubMed]
15. Murphy, J.; Vallières, F.; Bentall, R.P.; Shevlin, M.; McBride, O.; Hartman, T.K.; McKay, R.; Bennett, K.; Mason, L.; Gibson-Miller, J.; et al. Psychological characteristics associated with COVID-19 vaccine hesitancy and resistance in Ireland and the United Kingdom. *Nat. Commun.* **2021**, *12*, 29. [CrossRef] [PubMed]
16. Schwarzinger, M.; Watson, V.; Arwidson, P.; Alla, F.; Luchini, S. COVID-19 vaccine hesitancy in a representative working-age population in France: A survey experiment based on vaccine characteristics. *Lancet Public Health* **2021**, *6*, e210–e221. [CrossRef]
17. Braun, V.; Clarke, V. Using thematic analysis in psychology. *Qual. Res. Psychol.* **2006**, *3*, 77–101. [CrossRef]
18. Freeman, D.; Loe, B.S.; Chadwick, A.; Vaccari, C.; Waite, F.; Rosebrock, L.; Jenner, L.; Petit, A.; Lewandowsky, S.; Vanderslott, S.; et al. COVID-19 vaccine hesitancy in the UK: The Oxford coronavirus explanations, attitudes, and narratives survey (Oceans) II. *Psychol. Med.* **2020**, *52*, 3127–3141. [CrossRef]
19. Shahwan, M.; Suliman, A.; Abdulrahman Jairoun, A.; Alkhoujah, S.; Al-Hemyari, S.S.; Al-Tamimi, S.K.; Godman, B.; Mothana, R.A. Prevalence, knowledge and potential determinants of COVID-19 vaccine acceptability among university students in the United Arab Emirates: Findings and implications. *J. Multidiscip. Healthc.* **2022**, *11*, 81–92. [CrossRef]
20. Klüver, H.; Hartmann, F.; Humphreys, M.; Geissler, F.; Giesecke, J. Incentives can spur COVID-19 vaccination uptake. *Proc. Natl. Acad. Sci. USA* **2021**, *118*, e2109543118. [CrossRef]
21. Fishman, J.; Salmon, M.K.; Scheitrum, D.; Schaefer, K.A.; Robertson, C.T. Comparative effectiveness of mandates and financial policies targeting COVID-19 vaccine hesitancy: A randomized, controlled survey experiment. *Vaccine* **2022**, *40*, 7451–7459. [CrossRef]
22. Baccolini, V.; Renzi, E.; Isonne, C.; Migliara, G.; Massimi, A.; De Vito, C.; Marzuillo, C.; Villari, P. Covid-19 vaccine hesitancy among Italian university students: A cross-sectional survey during the first months of the vaccination campaign. *Vaccines* **2021**, *9*, 1292. [CrossRef]
23. Trayner, K.M.; Anderson, N.; Cameron, J.C. A mixed-methods study to identify factors associated with MenACWY vaccine uptake, barriers and motivations towards vaccination among undergraduate students. *Health Educ. J.* **2018**, *78*, 189–202. [CrossRef]
24. Umakanthan, S.; Patil, S.; Subramaniam, N.; Sharma, R. COVID-19 Vaccine Hesitancy and Resistance in India Explored through a Population-Based Longitudinal Survey. *Vaccines* **2021**, *9*, 1064. [CrossRef] [PubMed]
25. Shih, T.H.; Fan, X. Comparing response rates in e-mail and paper surveys: A meta-analysis. *Educ. Res. Rev.* **2009**, *4*, 26–40. [CrossRef]
26. Nulty, D.D. The adequacy of response rates to online and paper surveys: What can be done? *Assess. Eval. High. Educ.* **2008**, *33*, 301–314. [CrossRef]
27. Kerr, J.R.; Schneider, C.R.; Recchia, G.; Dryhurst, S.; Sahlin, U.; Dufouil, C.; Arwidson, P.; Freeman, A.L.; Van Der Linden, S. Correlates of intended COVID-19 vaccine acceptance across time and countries: Results from a series of cross sectional surveys. *BMJ Open* **2021**, *11*, e048025. [CrossRef]
28. Khaled, S.M.; Petcu, C.; Bader, L.; Amro, I.; Al-Hamadi, A.M.H.A.; Al Assi, M.; Ali, A.A.M.; Le Trung, K.; Diop, A.; Bellaj, T.; et al. Prevalence and Potential Determinants of COVID-19 Vaccine Hesitancy and Resistance in Qatar: Results from a Nationally Representative Survey of Qatari Nationals and Migrants between December 2020 and January 2021. *Vaccines* **2021**, *9*, 471. [CrossRef]
29. Wang, X.; Cheng, Z. Cross-sectional studies: Strengths, weaknesses, and recommendations. *Chest* **2020**, *158*, S65–S71. [CrossRef]
30. Setia, M.S. Methodology series module 3: Cross-sectional studies. *Indian J. Dermatol.* **2016**, *61*, 261–264. [CrossRef]