

COVID-19 Vaccination Uptake and Self-Reported Side Effects among Healthcare Workers in Mbale City Eastern Uganda

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ABSTRACT

Background: Fear of anticipated side effects has hindered the COVID-19 vaccination program globally. We report the uptake and the self-reported side effects (SEs) of the COVID-19 vaccine among Healthcare workers (HCWs) in Mbale City Eastern Uganda.

Methods: A cross-sectional survey of HCWs at seven different level health facilities was conducted from 6th September to 7th October 2021 using a structured self-administered questionnaire.

Results: COVID-19 vaccine had been received by 119 (69%) participants of which 79 (66%) received the two recommended doses of the AstraZeneca vaccine. Getting vaccinated was associated with working in a lower health facility (aOR= 14.1, 95% CI: 4.9 – 39.6, P=0.000), perceived minor risk of contracting COVID-19 (aOR= 12.3, 95% CI: 1.0 – 44.6, p=0.047), and agreeing that COVID-19 vaccine is protective (aOR= 16.7, 95% CI: 5.6 – 50.4, p=0.000). 97 (82%) of participants experienced side effects to at least one dose of which most were mild on both the first (n=362, 51%) and second dose (n=135, 69%). The most frequently reported side effects on the first and second dose were fever (79% and 20%), injection site pain (71% and 25%), and Fatigue (69% and 20%) respectively.

Conclusions: The majority of the HCWs in Mbale City had received at least one dose of the COVID-19 vaccine and experienced a side effect. The side effects were mostly mild on either dose thus the vaccines are generally safe.

Keywords: COVID-19 vaccine, associated factors, side effects, healthcare workers, Eastern Uganda.

INTRODUCTION

Coronavirus disease-2019 (COVID-19) is a viral pneumonia caused by the novel SARS-CoV-2 which was first reported in Wuhan, China in December 2019 and continues to pose a significant threat to public health globally (1). As of 26th November 2021, over 260 million cases and over 5.2 million deaths have been reported worldwide (Worldometer, 2021). In Uganda, the first case of COVID-19 was reported on 21st March 2020 (3), and as of 26th November 2021, over 126,965 cases and about 3,239 deaths reported (Ministry of Health Uganda, 2021).

At the moment, no single effective therapeutic agent has been approved for the treatment of COVID-19. However, several public health measures like social distancing, national-wide lockdowns, and hand-washing among others have been employed to control the pandemic(5). Despite these measures, COVID-19 remains a major public health challenge with some countries experiencing the third and fourth waves (5). Currently, vaccination against SARS

CoV-2 is thought to be the best public health measure to halt the COVID-19 pandemic (6). There are currently several COVID-19 vaccine candidates with at least 8 vaccines approved for use by the World Health Organization. These include Moderna (mRNA-1273), Pfizer/BioNtech (BNT162b2), Jansen (ad26.COV2.S), Oxford/AstraZeneca (AZD1222), Covishield (Oxford/AstraZeneca formulation), Covaxin (Bharat Biotech), Sinopharm (BBIP-CorV), and Sinovac (CoronaVac) (7,8).

This first roll out of COVID-19 vaccinations was considered a land mark for overcoming the pandemic (9,10). However vaccination has long been faced with hesitancy due to public worries about side effects (SEs) and efficacy (11), which is worse with COVID-19 surrounded by conspiracies. The COVID-19 vaccines have however been reported by various clinical trials to be generally safe with limited side effects that are mild to moderate with a few severe reactions (12–15).

Healthcare workers (HCWs) are not only a high-risk group but also offer guidance on vaccine recommendations to the public which relies on them for this information (16,17). Automatic uptake of the COVID-19 vaccine by HCWs is not guaranteed as a study done in Israel, reported a high rate of COVID-19 vaccine skepticism among this group (18). Vaccination compliance relies on a personal risk–benefit perception, and broader political, religious, social, and historical factors (17).

Also, most data about side effects of the COVID-19 vaccines comes from manufacturer-funded studies in compliance with drug regulatory authorities which warrants continuous monitoring of adverse events (9,19). Ever since Uganda rolled out its vaccination program, no study has been published about the side effects of the vaccine among those that have received it. Therefore, we determined the uptake of the COVID-19 vaccine and self-reported side effects among healthcare workers in Mbale city, Eastern Uganda.

Methods

Study Design

This was a descriptive, cross-sectional study carried out from 6th September to 7th October 2021 using a quantitative approach.

Study Setting

This study was carried out in seven health facilities in Mbale city, including six government facilities; Mbale regional referral hospital, Namatala Health centre IV, Malukhu Health Centre III, Namakwekwe Health Centre III, Busamaga Health Centre III, Mbale Municipal Health Centre II and The AIDS Support Organization (TASO) Mbale Centre of excellence a

private-not-for-profit facility. Uganda's health system has both public and private sector which has private-for-profit and private-not-for-profit facilities. The public health sector is divided into national (governed by the ministry of health) and district (governed by district health management team) based level facilities. The national level consists of national referral hospitals at the top then regional referral hospitals. The district level has the district hospitals at the helm followed by health centers IV, III, II and community extension health workers called Village health team (VHTs) serving as level I. Mbale city is located in the Eastern region of Uganda. Mbale Regional Referral Hospital is a tertiary hospital—serving the districts of Busia, Buddaka, Kibuku, Kapchorwa, Bukwa, Butaleja, Manafwa, Mbale, Pallisa, Sironko, budduda, Bukedea and Tororo(20). It's a 470-bed capacity hospital and serves as a teaching hospital for Busitema University Faculty of Health Sciences as well as an Internship center for graduates from medical schools for a one-year internship under the supervision of qualified specialists and Consultants.

Study Population

Healthcare workers in the selected facilities were involved in the study. A healthcare worker was considered as any person engaged in activities whose primary role is to improve the health of patients including nurses, midwives, intern doctors, medical officers, senior house officers, pharmacists, laboratory technicians and specialists in the field of medicine. Mbale Regional Referral Hospital (MRRH) had a total of 243 permanent HCWs and 57 interns on a temporary one-year contract. The other five lower health centers had a total of 120 trained health care workers of different cadres. TASO Mbale Centre of excellence had 31 full- time staff. This makes a total of about 451 health care workers in primary contact with patients within the selected health facilities in Mbale city currently.

Inclusion and Exclusion Criteria

HCWs at selected health facilities within Mbale city who consented to participate were included and those that didn't consent or were absent on duty were excluded.

Sampling Procedure and Data collection

The research followed a proportional stratified random sampling technique. The study population was stratified by level of health facility each taking a proportion depending on the percentage contribution to the total required sample size. Participants were enrolled by random sampling at that particular time data was collected at the facility. Data was collected using semi-structured questionnaire that was provided by research assistants at each facility. The research assistants were trained on the unique aspects of the study via a zoom session after they had been identified. Questionnaires were administered by hardcopy after informed consent had been given by the participant.

Data Collection tool

We used a modified questionnaire based on those that were used by other scholars. The questionnaire was semi-structured with 28 questions divided into five sections capturing socio-demographic information of participants, COVID-19 related experiences and attitudes towards COVID-19 vaccine, its uptake, and self-reported side effects among health workers that have taken the vaccine.

Data Analysis

Data from completed questionnaires were entered in Microsoft Excel 2016, cleaned, coded and analyzed using STATA 16. Descriptive statistics, and bivariate and multivariable logistic regression analyses were performed, and results were presented as tables, charts and figures. Chi-square or Fisher's exact test was used to assess associations between vaccine uptake and independent variables. An association with a p-value less than 0.05 was considered statistically significant.

Results

Baseline characteristics of the participants

One hundred seventy-two (172) participants were interviewed giving a 45% response rate. Most were female (n=95, 55%), married (n=90, 52%), with a median age of 31 (IQR: 25-39) years. Most participants were from Mbale Regional Referral Hospital (n=92, 53%). Forty-three (25%) participants were nursing officers and the minority were specialists (n=6, 3%), (Table 1).

Table 1: Demographic characteristic of participants (N=172)

VARIABLE	Frequency	Percentage
Age (Median; IQR), years	31 (25-39)	
18-39	130	76
≥40	42	24
Sex		
Female	95	55
Male	77	45
Marital status		
Single	76	44
Married	90	52
Divorced/Separated	1	1
Widowed	5	3
Religion		
Roman catholic	46	27
Anglican	59	34
Pentecostal	42	24

Muslim	24	14
Others	1	1
Cadre		
Medical officer	15	9
Nursing officer	43	25
Pharmacist	3	2
Midwife	38	22
Interns	42	24
Laboratory technician	15	9
Specialists	6	3
Clinical Officers	8	5
Counsellors	2	1
Health Facility		
Health center II	13	8
Health center III	41	24
Health center IV	20	12
Mbale Regional Referral Hospital	92	53
Private Not for Profit	6	3

COVID-19 vaccine uptake among healthcare workers

The majority of the participants (n=119, 69%) had received at least one dose of the COVID-19 vaccine. Of these, 79 (66%) had received two doses. The major reason for being vaccinated was to protect oneself (n=95, 79%) and others (n=62, 52%) from COVID-19. Among unvaccinated participants, the majority (n=21, 40%) were still hesitant and not sure whether they majority will take it in future. The major reasons for not accepting to be vaccinated against COVID-19 were uncertainty about the vaccine safety (n=31, 55%), and negative information about the vaccine (n=30, 54%), (Table 2).

Table 2: COVID-19 vaccine uptake and reasons for and against among participants

Have you been vaccinated against COVID-19?	Frequency	Percentage
Yes	119	69
No	53	31
The number of COVID-19 vaccine doses received.		
One Dose	40	34
Two Doses	79	66
Are you intending to take the COVID-19 vaccine in the future?		
Yes, I will get vaccinated	18	34
I am not sure	21	40
No, I will not get vaccinated	14	26
Reasons for COVID-19 vaccine uptake		
To protect me from getting COVID-19	95	79
To protect others from getting COVID-19	62	52
I believe in vaccines and immunization	48	40
Government recommendations	64	53

Because my colleague had taken it	7	6
The vaccines are safe	42	35
The vaccines are effective	36	30
It is a social and moral responsibility	25	21
The vaccine was free of charge	38	32
To be able to travel	31	26
I am at high risk of severe disease	30	25
To get rid of the virus and end the pandemic	25	21
It's a job requirement	38	32
It's my obligation as a healthcare worker to motivate others	61	51
Reasons for not getting the COVID-19 vaccine		
I don't think it is needed	12	21
I trust my immunity	18	32
I don't know where to get the vaccination	1	2
I don't know where to get good/reliable information	4	7
I have heard or read negative information on the vaccine.	30	54
I don't think the vaccine is effective	24	43
I don't think the vaccine is safe/concerned about side effects	31	55
Someone else told me that the vaccine is not safe	9	16
Had a bad experience with a previous vaccinator/health clinic	2	4
Had a bad experience or reaction to previous vaccination	6	11
Someone else told me they/their child had a bad reaction	12	21
Fear of needles	2	4
Religious reasons	4	7
Other beliefs/traditional medicine	3	5

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159 **Factors associated with COVID-19 vaccine uptake among health workers**

160 At bivariable analysis, age ($p=0.002$), marital status ($p=0.019$), the cadre of the staff
161 ($p<0.001$), level of health facility ($p<0.001$), belief in the effectiveness of the COVID-19
162 vaccine ($p<0.001$) and having a chronic illness ($p=0.021$) were statistically significantly
163 associated with COVID-19 vaccine uptake, Table 3.

164 **Table 3: Uptake of COVID-19 vaccine and associated factors among the participants**

VARIABLE	COVID-19 VACCINE UPTAKE		P-VALUE
	YES Frequency (%)	NO Frequency (%)	
All participants	119 (69)	53 (31)	
Age , years			
18-39	82 (70)	48 (91)	0.002
≥40	37 (30)	5 (9)	
Sex			
Female	66 (55)	29 (55)	0.928
Male	53 (45)	24 (45)	

Marital status			
Single	45 (38)	31 (58)	0.019
Married	68 (57)	22 (42)	
Separated	6 (5)	0 (0)	
Religion			
Roman Catholic	36 (30)	10 (19)	0.454
Anglican	40 (34)	19 (36)	
Pentecostal	27 (23)	15 (28)	
Muslim	15 (13)	9 (17)	
Others	1 (1)	0 (0)	
Cadre			
Medical officer	11 (9)	4 (8)	<0.001
Nursing officer	35 (29)	8 (15)	
Pharmacist	2 (2)	1 (2)	
Midwife	30 (25)	8 (15)	
Interns	15 (13)	27 (51)	
Laboratory technician	13 (11)	2 (4)	
Specialists	6 (5)	0 (0)	
Clinical Officers	5 (4)	3 (6)	
Counsellors	2 (2)	0 (0)	
Health Facility			
Lower Health Facility	66 (55)	8 (15)	<0.001
Hospital	53 (45)	45 (85)	
Perceived likelihood of getting COVID-19 in the future?			
Not at all	27 (23)	21 (40)	0.072
Slightly	48 (40)	16 (30)	
Very likely	44 (37)	16 (30)	
Overall worry about COVID-19?			
Very worried	49 (41)	19 (36)	0.332
Somewhat worried	52 (44)	21 (40)	
Not at all worried	18 (15)	13 (25)	
Perceived COVID-19 personal risk.			
Major risk	71 (60)	33 (62)	0.072
Minor risk	44 (37)	14 (26)	
No risk at all	4 (3)	6 (11)	
Have you been tested for COVID-19?			
Tested positive	8 (7)	7 (13)	0.060
Tested negative	60 (50)	17 (32)	
Haven't tested	51 (43)	29 (55)	
Active involvement in COVID-19 management			
Yes	66 (55)	23 (43)	0.144
No	53 (45)	30 (57)	
COVID-19 vaccine gives effective protection			
Agree	73 (61)	11 (21)	<0.001
Neutral	15 (13)	9 (17)	
Disagree	31 (26)	33 (62)	
Chronic illness			
Yes	23 (19)	3 (6)	0.021
No	96 (81)	50 (94)	

At multivariable analysis, factors independently associated with uptake of the COVID-19 vaccine were as follows: working in a lower health facility (aOR= 14.1, 95% CI: 4.9 – 39.6, P=0.000), individual perceived minor risk of contracting COVID-19 (aOR= 12.3, 95% CI: 1.0 – 44.6, p=0.047), and agreeing that COVID-19 vaccine is protective (aOR= 16.7, 95% CI: 5.6 – 50.4, p=0.000), (Table 4).

Table 4: Multivariate logistic regression for factors associated with COVID-19 vaccine uptake among participants.

VARIABLE	OR (95% CI)	P-VALUE	AOR (95% CI)	P-VALUE
Age				
18-39	Ref		Ref	
40 years and above	4.3 (1.6 – 11.8)	0.004	2.7 (0.7 – 10.2)	0.136
Marital Status				
Single	0.5 (0.2 – 0.9)	0.026	0.6 (0.2 – 1.6)	0.353
Separated	Ref		Ref	
Cadre				
Medical officer	1.2 (0.2 – 6.9)	0.856		
Nursing officer	1.9 (0.4 – 8.9)	0.428		
Pharmacist	0.9 (0.1 – 13.4)	0.913		
Midwife	1.6 (0.3 – 7.7)	0.551		
Interns	0.2 (0.1 – 1.1)	0.059		
Laboratory technician	2.8 (0.4 – 20.8)	0.318		
Specialists	Ref			
Health Facility				
Lower Health Facility	7.0 (3.0 – 16.1)	0.000	14.1 (4.9 – 39.6)	0.000
Hospital	Ref		Ref	
Perceived likelihood of getting COVID-19 in the future?				
Not at all	Ref		Ref	
Slightly	2.3 (1.0 – 5.2)	0.039	1.8 (0.5 – 5.8)	0.360
Very likely	2.1 (0.9 – 4.8)	0.065	1.3 (0.4 – 4.4)	0.677
Perceived COVID-19 personal risk.				
Major risk	3.2 (0.9 – 12.2)	0.084	8.2 (0.9 – 98.2)	0.097
Minor risk	4.7 (1.2 – 19.1)	0.030	12.3 (1.0 – 44.6)	0.047
No risk at all	Ref		Ref	
Have you been tested for COVID-19?				
Tested positive	0.6 (0.2 – 1.9)	0.447		
Tested negative	2.0 (0.9 – 4.1)	0.053		
Haven't tested	Ref			
COVID-19 vaccine gives effective protection.				
Agree	7.1 (3.2 – 15.7)	0.000	16.7 (5.6 – 50.4)	0.000
Disagree	1.8 (0.7 – 4.6)	0.242	1.3 (0.3 – 4.9)	0.728
Neutral	Ref		Ref	
Active involvement in COVID-19 management				
Yes	1.6 (0.8 – 3.1)	0.145		
No	Ref			

Chronic illness				
Yes	4.0 (1.1 – 13.9)	0.030	3.1 (0.6 – 15.0)	0.168
No	Ref		Ref	

Self-reported side-effects among covid-19 vaccine recipients

The majority of the COVID-19 vaccine recipients (n=97, 82%) experienced side-effects of at least one dose of the vaccine which lasted for a median duration of 3 (IQR: 3-7) days. All recipients (n=97, 100%) experienced at least one side effect on their first dose of vaccination and only thirty-eight (39%) on the second dose, Figure 2. Most of the side-effects were mild on both the first (n=362, 51%) and second dose (n=135, 69%). Severe side-effects were experienced more on the first (11%) than second (7%) dose (Figure 3).

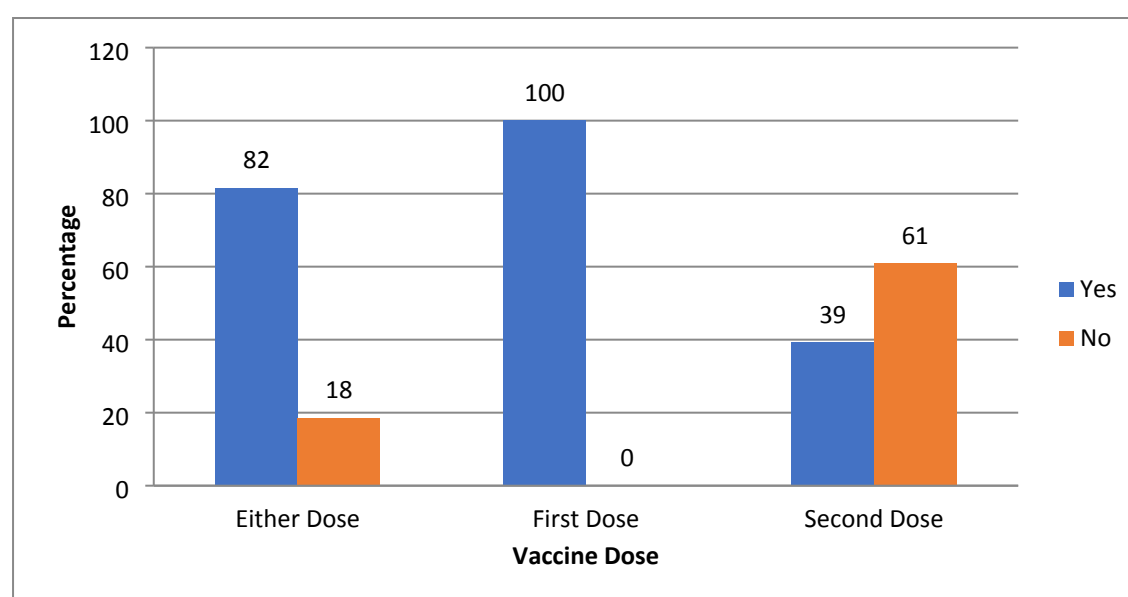


Figure 2: Occurrence of self-reported side-effects on the different vaccine doses

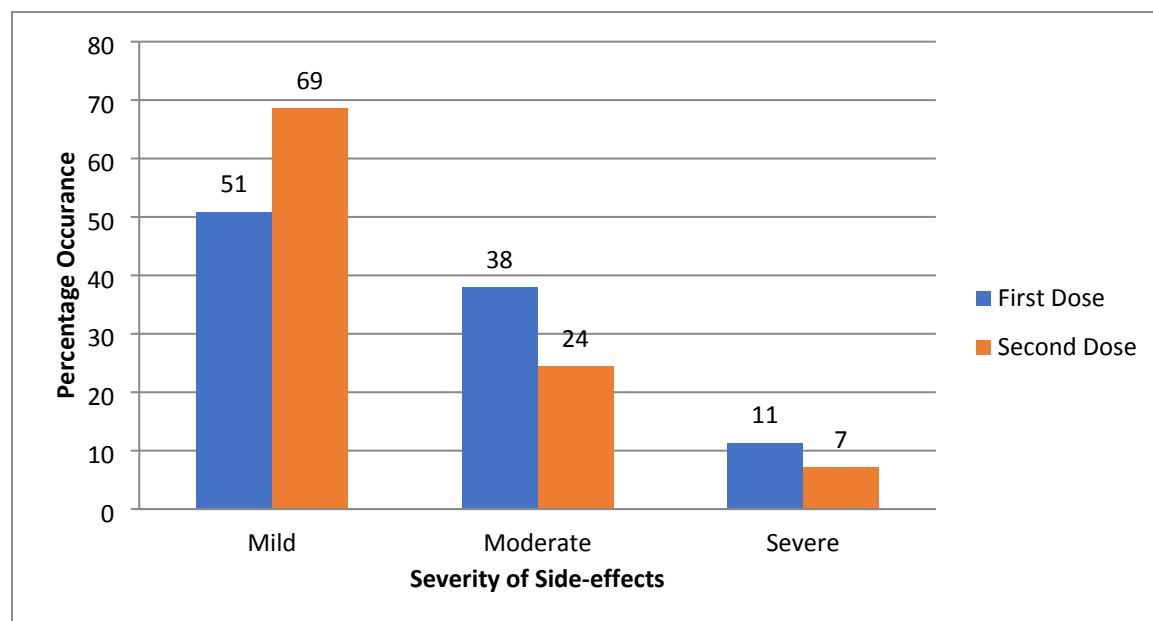


Figure 3: Severity of self-reported side-effects on the different vaccine doses

The most frequently reported side-effects of the first and second dose were fever (79% and 20%), injection site pain (71% and 25%) and Fatigue (69% and 20%) respectively, Figure 4. Participants who had ever tested positive for COVID-19 experienced side effects for a longer duration (median= 7, IQR: 3-11 days) compared to those who had either tested negative (median= 5, IQR: 3—5 days) or had never tested (median= 3, IQR: 3-5 days). There was no statistically significant difference in the duration of side-effects among the different age groups (Figure 5).

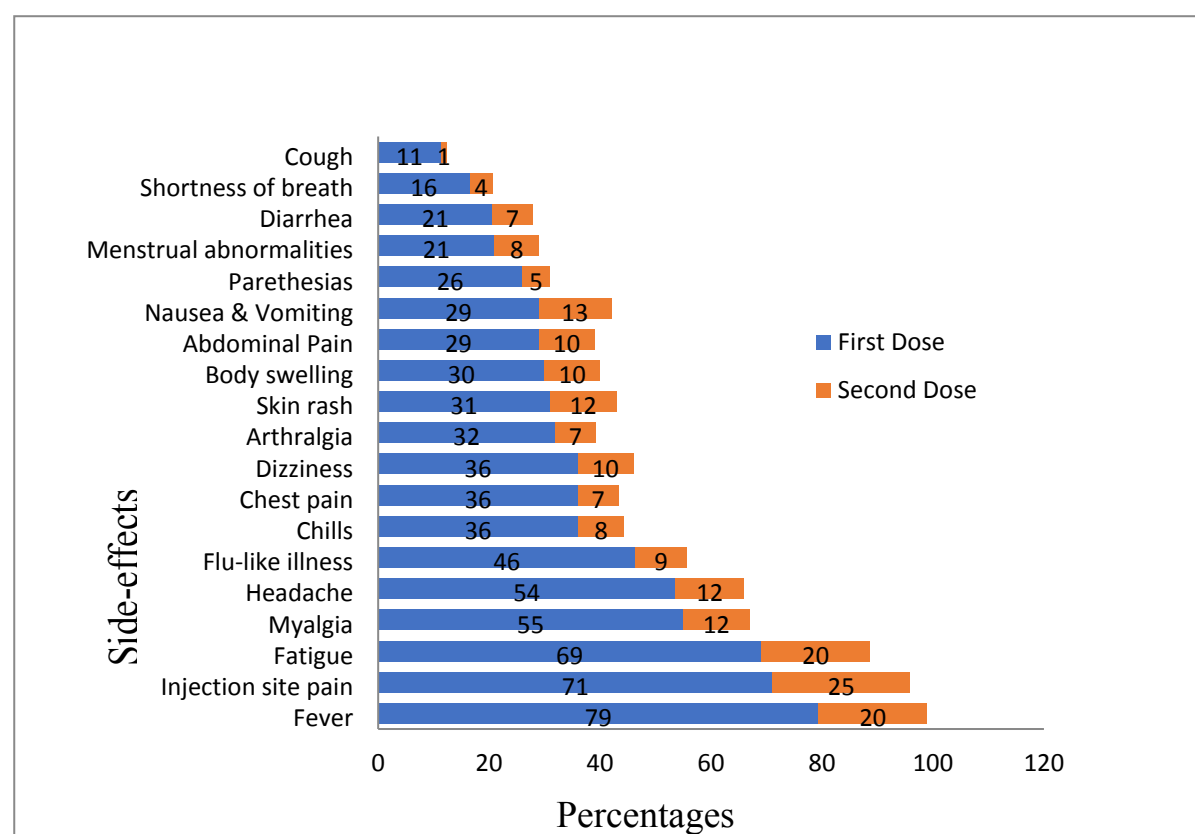


Figure 4: The different self-reported side effects on both COVID-19 vaccine doses

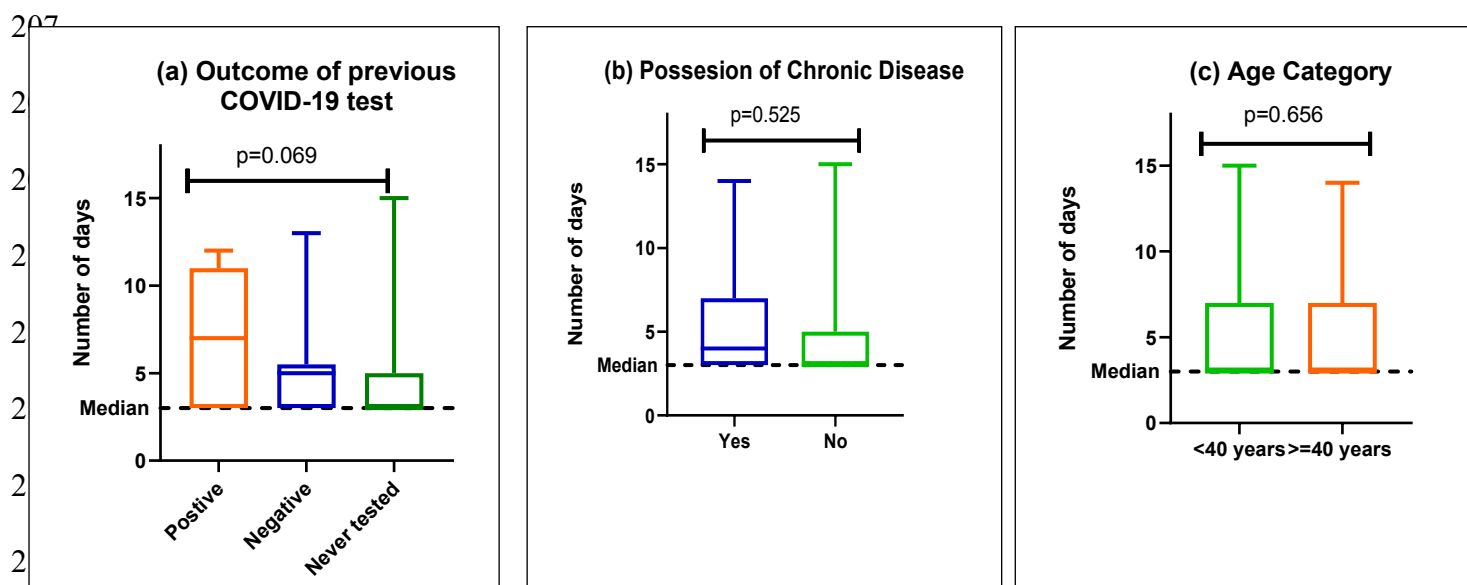


Figure 5: Duration of self-reported side-effects compared among (a) outcomes of previous COVID-19 test (b) possession of chronic illness and (c) age category. Median duration of side-effects is 3 days

DISCUSSION

Health Care Workers (HCWs) being at the frontline in the fight against the pandemic are at a high risk of contracting COVID-19 as they provide medical services to COVID-19 patients. (21). As a result several HCWs have succumbed to COVID-19, with variable morbidity and mortality reported from different countries (22). In the COVID-19 vaccination programs of most countries in low- and middle-income countries (23). HCWs have been prioritized due to the limited supply of the COVID-19 vaccine. Despite this, COVID-19 vaccine hesitancy has been reported globally, including among HCWs and the WHO reports it among the top 10 global threats to health (18).

In this study, a high proportion (79%) of HCWs had received at least one dose of the COVID-19 vaccine. Our findings are similar to the 71.1% COVID-19 vaccine uptake reported in 19 countries among healthcare workers (24). However, in contrast, lower vaccine acceptability was reported in the U.S.A (36%) (16) and Turkey (31%) (25). Higher acceptability rates have been reported among HCWs in France (81.5%) (23), Mozambique (88.6%) (26) China (91.3%) (27), and Indonesia (95%) (28). It's reasonable that Asian countries like China which was hit hard by the pandemic reported higher uptake of the vaccine. The participants that believed that the vaccine was effective were twenty-eight times

more likely to get vaccinated. This finding is in line with another study where participants who believed that COVID-19 vaccination, is an effective way to prevent and control COVID-19 tended to accept COVID-19 vaccination as soon as possible (18). Furthermore, HCWs who perceived a major risk of contracting COVID-19 and had previously tested negative for COVID-19 took up the vaccine. Indeed in a multicenter study, Evridiki et al reported that increased risk perception towards COVID 19 was associated with the likely uptake of the COVID-19 vaccine (29). Working at a lower health facility had 25 -fold higher odds of uptake of the COVID-19 vaccine.

In this study, most of the side effects reported were mild (51%) in correspondence with the known side effects of the AstraZeneca vaccine (12–15). Most reported side effects included fever, injection site pain, and fatigue, and this is in line with a systematic review that reported the same adverse effects from various clinical trials (9,30). Participants reported more severe side effects with the first than the second dose in contrast to Mathioudakis et al who noted more side effects with the second dose (10). After the first vaccine dose, the body gets sensitized to the antigens and a severe immune reaction is expected on the booster dose. Probably most of the vaccine recipients could have been infected at the time of vaccination with sensitized immune systems that reacted severely to re-exposure of the virus since prior testing to vaccination wasn't done. To further reinforce that, participants who had ever tested positive for COVID-19 experienced a longer duration of symptoms compared to those who tested negative.

Limitations and Strengths

The study provides results from multiple health facilities, and information about the relatively real-world safety profiles of the AstraZeneca vaccine in Uganda. However, this study has some limitations; the sample size is relatively small and was conducted mainly in an urban setting in a single city thus the findings may not be confidently generalizable to the rest of the country. Future studies involving a larger sample size are recommended to provide a complete side-effects profile of COVID-19 vaccines among recipients in Uganda.

Conclusion

In conclusion, our findings have shown high levels of uptake of the COVID-19 vaccine among HCWs in Mbale city. At least four-fifth of HCWs experienced at least one SE after receiving the COVID-19 vaccine. Most of the side effects were mild and the same as those seen in other commonly provided vaccines therefore the vaccines are generally safe and can be taken by the public with confidence.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health

Consent for publication

Not applicable

Ethical Consideration

The proposal was submitted for ethical review and approved by the Research Ethics Committee of Cure Children's Hospital Uganda (CCHU-REC) under approval number CCHU-REC/02/2021. Additional permission was requested from the administration of the health facilities where the study was carried out and all participants provided an informed consent. The ethical principles of involvement of human research subjects as outlined in the *Nuremberg Code* and the *Declaration of Helsinki* were strictly adhered to.

Authors' contributions

This study was carried out with considerable contributions from all authors. Author FB, AMK, AGN, BA, Awn, GMA, RM, JSI and SBO, conceptualized and design the study protocol. Author AMK, GMA, AGN, BA, Awn, DK, JK, RM, and DM, participated in data collection. AMK, FB, GMA and JSI analyzed the data. Author GMA and AMK drafted the first manuscript, NK and JSI conducted critical reviews. All authors reviewed and approved the final manuscript.

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Table 1: Demographic characteristic of participants (N=172)

VARIABLE	Frequency	Percentage
Age (Median; IQR), years	31 (25-39)	
18-39	130	76
≥40	42	24
Sex		
Female	95	55
Male	77	45
Marital status		
Single	70	41
Married	90	52
Divorced/Separated	1	1
Widowed	5	3
Religion		
Roman catholic	46	27
Anglican	59	34
Pentecostal	42	24
Muslim	24	14
Others	1	1
Cadre		
Medical officer	15	9
Nursing officer	43	25
Pharmacist	3	2
Midwife	38	22
Interns	42	24
Laboratory technician	15	9
Specialists	6	3
Clinical Officers	8	5
Counsellors	2	1
Health Facility		
Health center II	13	8
Health center III	41	24
Health center IV	20	12
Mbale Regional Referral	92	53

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Hospital		
Private Not for Profit	6	3

Table 2: COVID-19 vaccine uptake and reasons for and against among participants

Have you been vaccinated against COVID-19?	Frequency	Percentage
Yes	119	69
No	53	31
Number of COVID-19 vaccine doses received.		
One Dose	40	34
Two Doses	79	66
Are you intending to take COVID-19 vaccine in future?		
Yes, I will get vaccinated	18	34
I am not sure	21	40
No, I will not get vaccinated	14	26
Reasons for COVID-19 vaccine uptake		
To protect myself from getting COVID-19	95	79
To protect others from getting COVID-19	62	52
I believe in vaccines and immunization	48	40
Government recommendations	64	53
Because my colleague had taken it	7	6
The vaccines are safe	42	35
The vaccines are effective	36	30
It is a social and moral responsibility	25	21
The vaccine was free of charge	38	32
To be able to travel	31	26
I am at high risk of severe disease	30	25
To get rid of the virus and end the pandemic	25	21
It's a job requirement	38	32
It's my obligation as a healthcare worker to motivate others	61	51

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Reasons for not getting COVID-19 vaccine		
I don't think it is needed	12	21
I trust my immunity	18	32
I don't know where to get vaccination	1	2
I don't know where to get good/reliable information	4	7
I have heard or read negative information on the vaccine.	30	54
I don't think the vaccine is effective	24	43
I don't think the vaccine is safe/concerned about side effects	31	55
Someone else told me that the vaccine is not safe	9	16
Had a bad experience with previous vaccinator/health clinic	2	4
Had a bad experience or reaction with previous vaccination	6	11
Someone else told me they/their child had a bad reaction	12	21
Fear of needles	2	4
Religious reasons	4	7
Other beliefs/traditional medicine	3	5

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Table 3: Uptake of COVID-19 vaccine and associated factors among the participants

VARIABLE	COVID-19 VACCINE UPTAKE		P-VALUE
	YES Frequency (%)	NO Frequency (%)	
All participants	119 (69)	53 (31)	
Age , years			
18-39	82 (70)	48 (91)	0.002
≥40	37 (30)	5 (9)	
Sex			
Female	66 (55)	29 (55)	0.928
Male	53 (45)	24 (45)	
Marital status			
Single	45 (38)	31 (58)	0.019
Married	68 (57)	22 (42)	
Separated	6 (5)	0 (0)	

Religion			
Roman Catholic	36 (30)	10 (19)	0.454
Anglican	40 (34)	19 (36)	
Pentecostal	27 (23)	15 (28)	
Muslim	15 (13)	9 (17)	
Others	1 (1)	0 (0)	
Cadre			
Medical officer	11 (9)	4 (8)	<0.001
Nursing officer	35 (29)	8 (15)	
Pharmacist	2 (2)	1 (2)	
Midwife	30 (25)	8 (15)	
Interns	15 (13)	27 (51)	
Laboratory technician	13 (11)	2 (4)	
Specialists	6 (5)	0 (0)	
Clinical Officers	5 (4)	3 (6)	
Counsellors	2 (2)	0 (0)	
Health Facility			
Lower Health Facility	66 (55)	8 (15)	<0.001
Hospital	53 (45)	45 (85)	
Perceived likelihood of getting COVID-19 in future?			
Not at all	27 (23)	21 (40)	0.072
Slightly	48 (40)	16 (30)	
Very likely	44 (37)	16 (30)	
Overall worry about COVID-19?			
Very worried	49 (41)	19 (36)	0.332
Somewhat worried	52 (44)	21 (40)	
Not at all worried	18 (15)	13 (25)	
Perceived COVID-19 personal risk.			
Major risk	71 (60)	33 (62)	0.072
Minor risk	44 (37)	14 (26)	
No risk at all	4 (3)	6 (11)	
Have you been tested for COVID-19?			
Tested positive	8 (7)	7 (13)	0.060
Tested negative	60 (50)	17 (32)	

Haven't tested	51 (43)	29 (55)	
Active involvement in COVID-19 management			
Yes	66 (55)	23 (43)	0.144
No	53 (45)	30 (57)	
COVID-19 vaccine gives effective protection			
Agree	73 (61)	11 (21)	<0.001
Neutral	15 (13)	9 (17)	
Disagree	31 (26)	33 (62)	
Chronic illness			
Yes	23 (19)	3 (6)	0.021
No	96 (81)	50 (94)	

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Table 4: Multivariate logistic regression for factors associated with COVID-19 vaccine uptake among participants.

VARIABLE	AOR (95% CI)	P-VALUE
Age		
18-39	1	0.195
40 years and above	2.7 (0.5-12.3)	
Marital Status		
Single	0.5 (0.1-1.7)	0.301
Separated	1	
Religion		
Muslim	1	0.104
Roman Catholic	5.6 (0.6-45.8)	
Anglican	0.6 (0.1-4.5)	
Pentecostal	1.2 (0.1-9.8)	
Cadre		
Medical officer	2.7 (1.1-65.2)	0.534
Nursing officer	5.9 (0.2-124.6)	0.253
Pharmacist	185.8 (0.4-76.7)	0.089
Midwife	3.6 (0.1-80.1)	0.408
Interns	0.9 (0.0-17.0)	0.984

Laboratory technician Specialists	4.5 (0.1-147.3) 1	0.395
Health Facility		
Lower Health Facility Hospital	25.9 (5.9-112.7) 1	<0.001
Perceived likelihood of getting COVID-19 in future?		
Not at all	0.6 (0.1-3.1)	0.577
Slightly	0.9 (0.2-3.6)	0.948
Very likely	1	
Perceived COVID-19 personal risk.		
Major risk	14.3 (1.1-181.2)	0.039
Minor risk	25.1 (2.1-290.7)	0.010
No risk at all	1	
Have you been tested for COVID-19?		
Tested positive	1.4 (0.1-14.5)	0.731
Tested negative	3.3 (1.0-10.7)	0.046
Haven't tested	1	
COVID-19 vaccine gives effective protection.		
Agree	28.3 (6.3-126.1)	<0.001
Neutral	1.5 (0.2-8.7)	0.635
Disagree	1	
Active involvement in COVID-19 management		
Yes	2.2 (0.6-7.7)	0.193
No	1	
Chronic illness		
Yes	8.2 (0.8-80.6)	0.070
No	1	

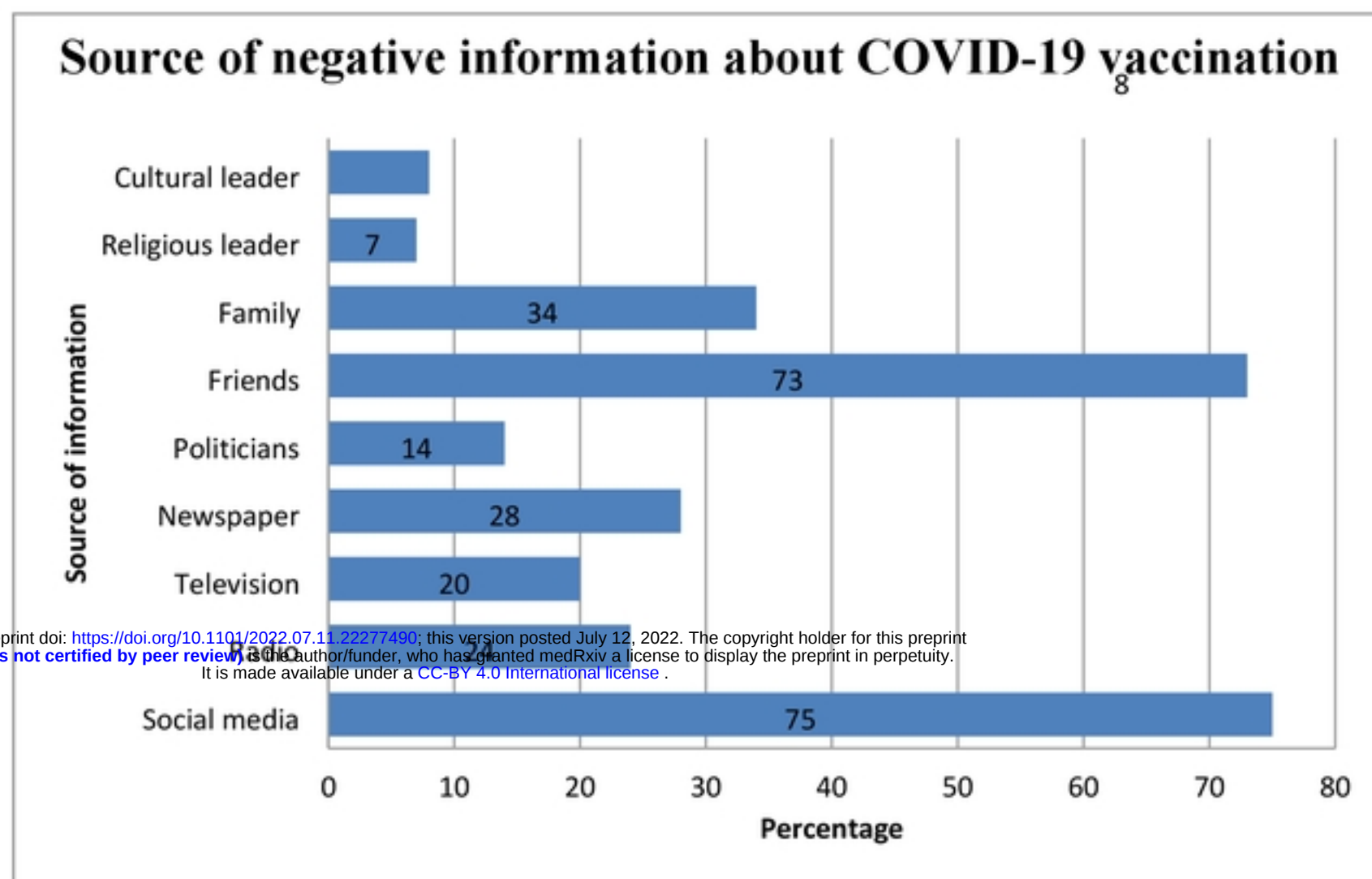


Figure 1: Sources of negative information about COVID-19 vaccination among participants

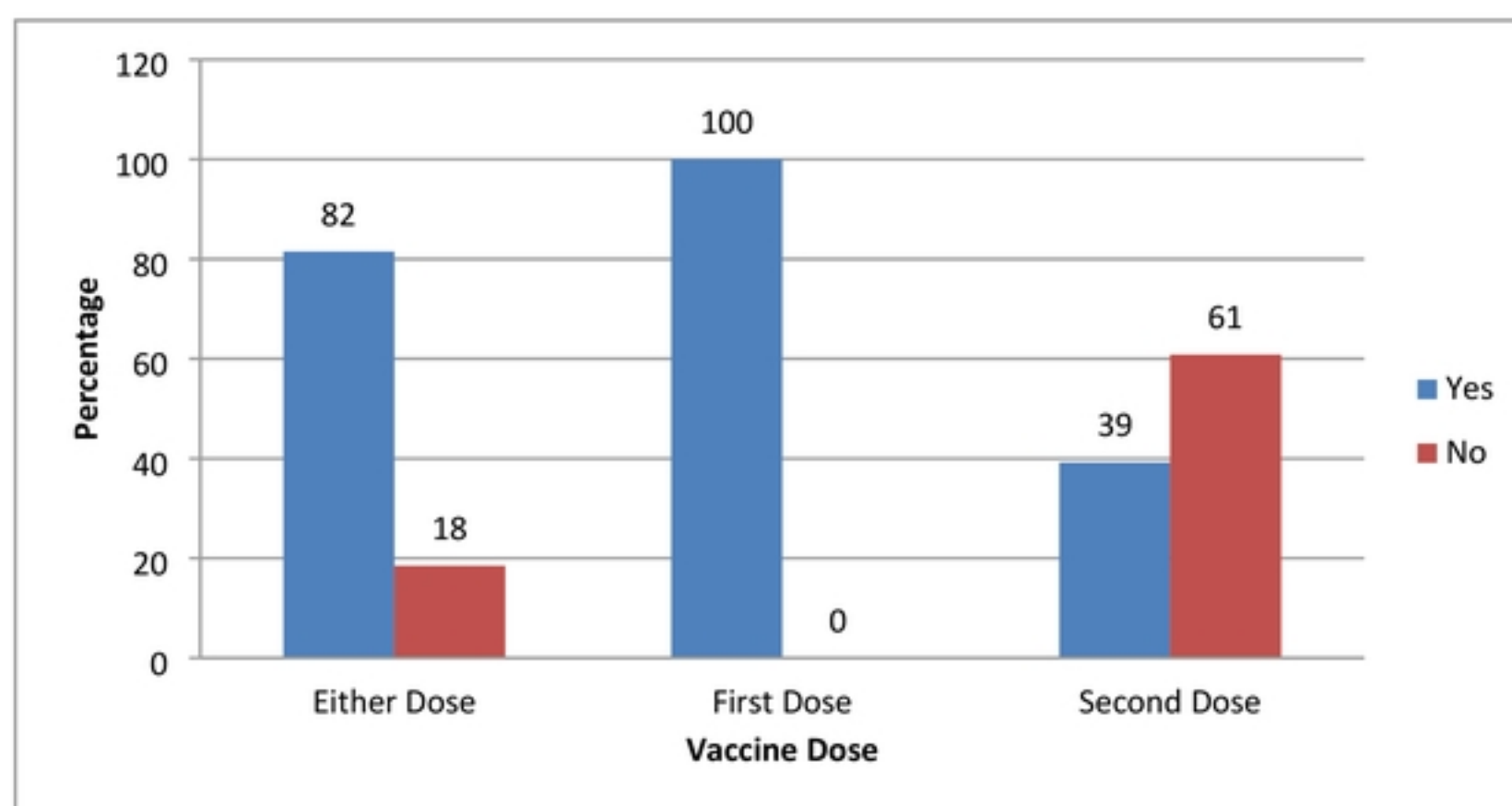


Figure 2: Occurrence of self-reported side-effects on the different vaccine doses

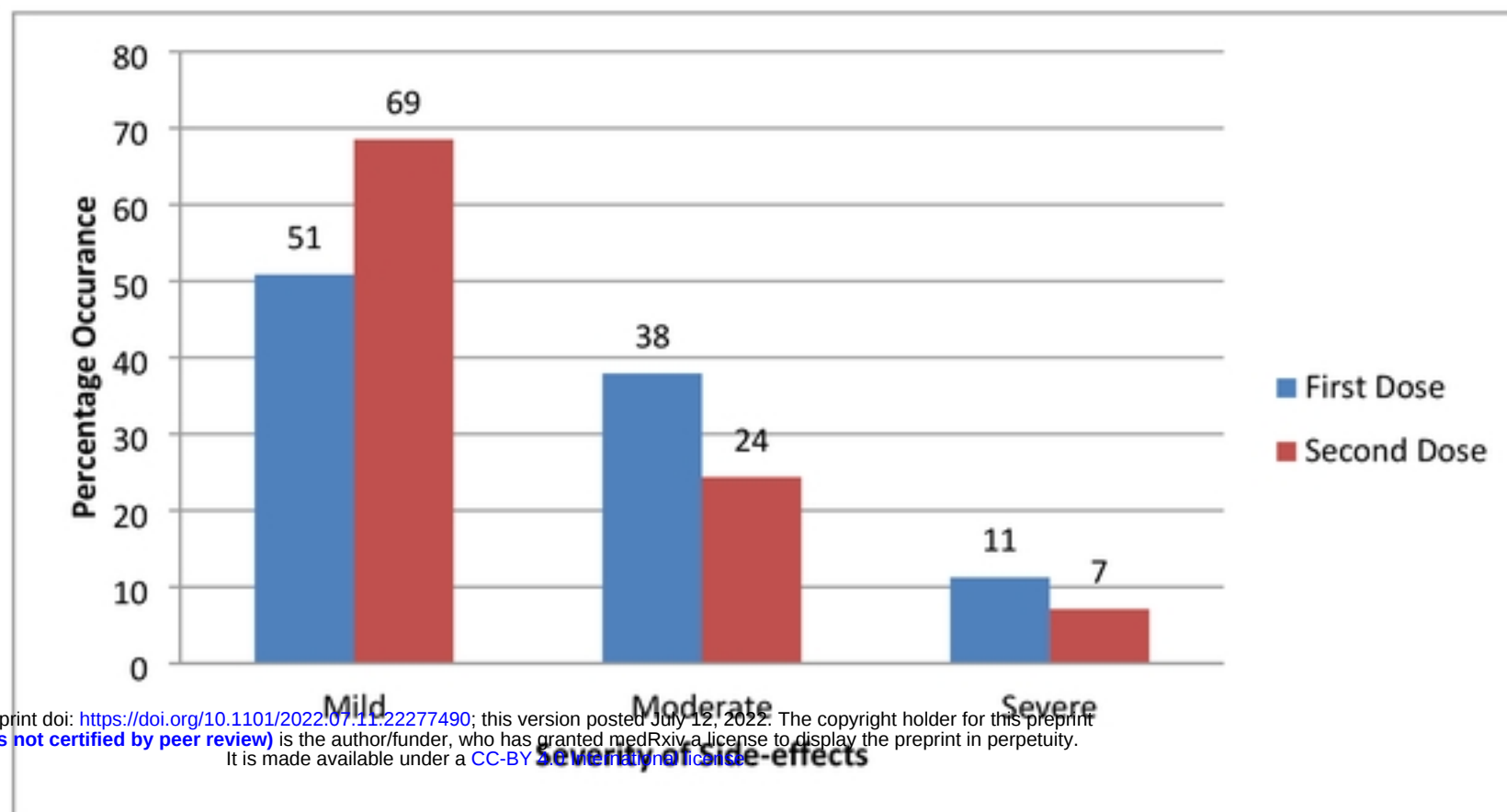


Figure 3: Severity of self-reported side-effects on the different vaccine doses

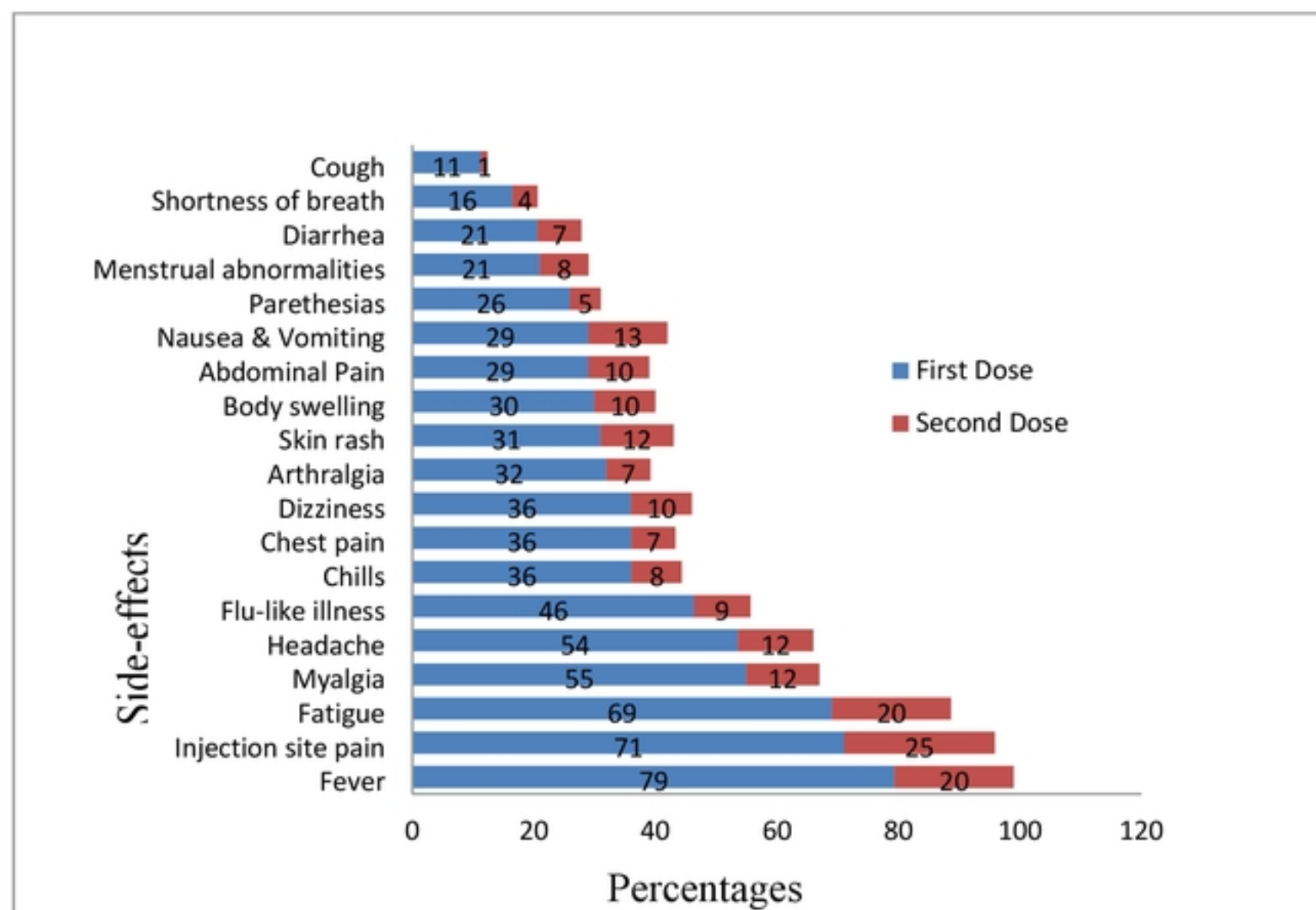


Figure 4: The different self-reported side effects on both COVID-19 vaccine doses

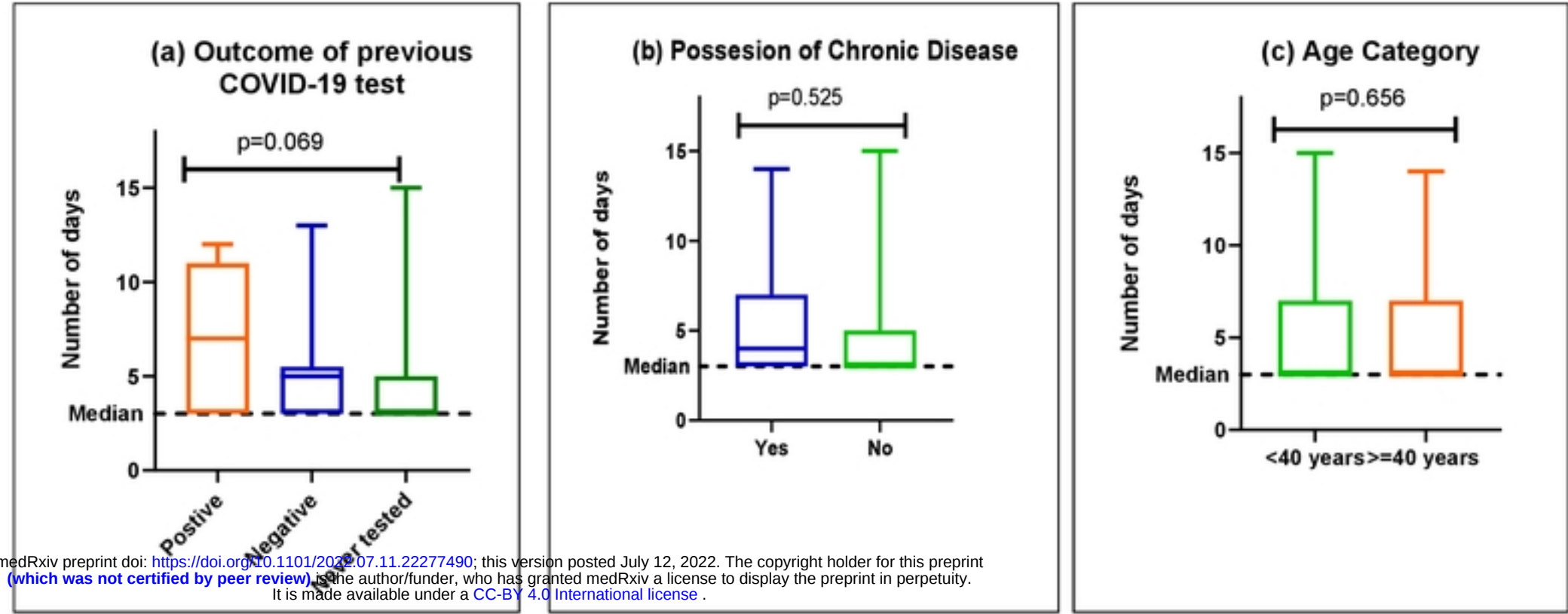


Figure 5: Duration of self-reported side-effects compared among (a) outcomes of previous COVID-19 test (b) possession of chronic illness and (c) age category. Median duration of side-effects is 3 days