



INTRODUCTION

COVID-19 pandemic has caused over 600 million infections and 6 million deaths¹. In HK, an Omicron BA.2 outbreak that started in January 2022 caused a surge of infections and deaths, later peaking at 70,000 infection and 200 death cases per day. In April, the daily infection and death cases decreased to <500 and <10 per day².

Importance of COVID-19 vaccines: Reduce infections, severe illness and death.

Approval of BNT162b2 and CoronaVac in HK: Feb 2021 - Age > 18 years; Nov 2021 - Age 12-17 years; Feb 2022 - age 5 to 11 years.

Risk of Covid-19 infection to patients with neuromuscular disorders (NMDs): High risk of severe infection as some patients may have weak respiratory muscles, and cardiac dysfunction and are on immunosuppressive treatment³.

Therefore, vaccination is important to patients with NMDs

Concern of patients: Efficacy and safety of Covid-19 vaccination

OBJECTIVES

- 1) To examine COVID-19 vaccine hesitancy of patients with NMDs
- 2) To understand the factors and concerns that affect patients' willingness to receive vaccination

MATERIALS AND METHODS

Study Population: Patients with NMDs aged 8-18 years old with normal IQ from our patient registry were invited to complete two surveys: one before and one after the Omicron BA.2 outbreak.

Information collected from the survey⁴: (1) Demographic data; (2) Clinical information; (3) Child's history of influenza vaccination; (4) Child and parents' history of COVID-19 vaccination ; (5) Child's intention of COVID-19 vaccination and reasons; (6) Concerns.

Survey: the 1st survey was conducted in Jan 2022 and the 2nd survey in April 2022, through phone interviews or by patient self-completion questionnaires online.

Data analysis : 1) comparison of patients' intention on vaccination before and after Omicron outbreak by the Cochran's Q test. 2) association between relevant factors and intention on COVID-19 vaccination by the Fisher's exact test.

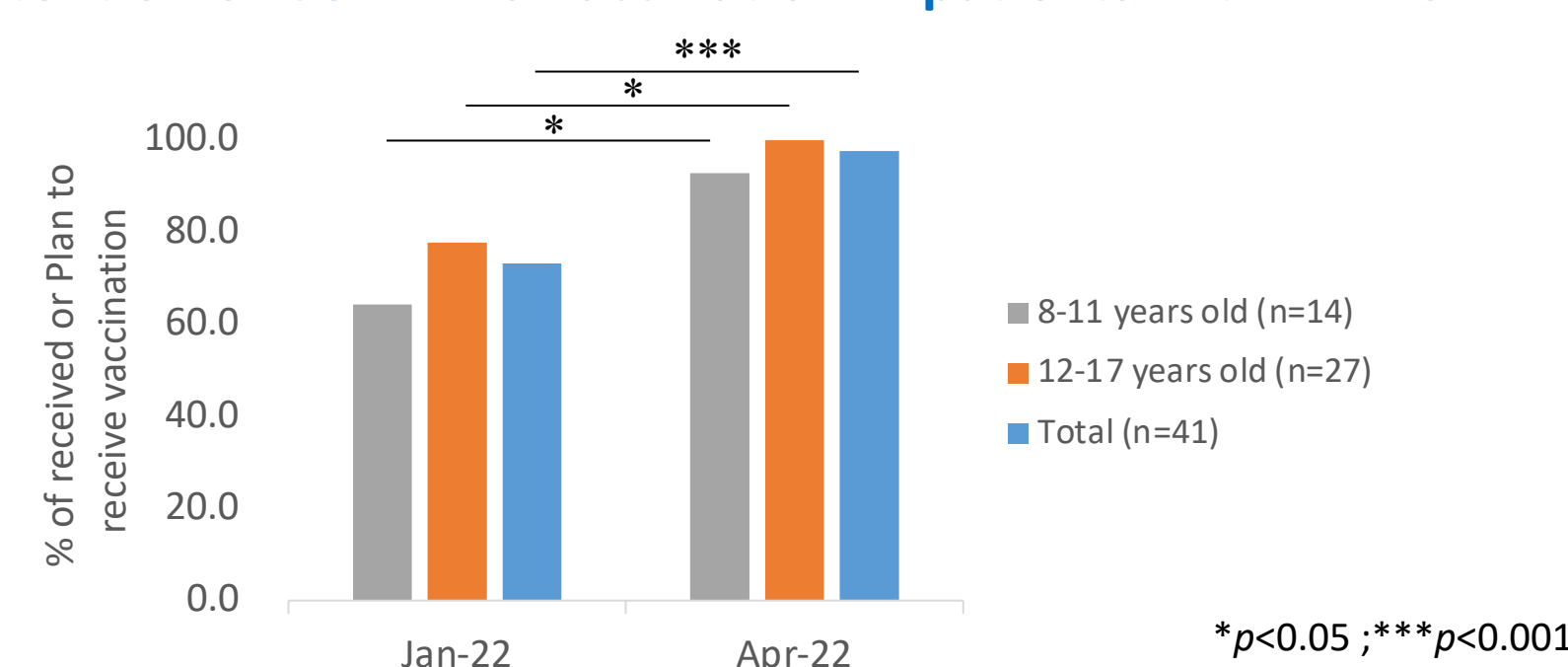
RESULTS

Demographic and clinical characteristics of the participants(n=41)

	Mean	SD
Demographics		
Age	13.8	3.4
	Number	%
Male	23	56.1
Types of NMDs		
Spinal muscular atrophy	18	43.9
5q Type I	2	4.9
5q Type II	10	24.4
5q Type III	5	12.2
Non-5q SMA	1	2.4
Dystrophinopathy	6	14.6
Duchenne muscular dystrophy	4	9.8
Becker muscular dystrophy	2	4.9
Congenital myopathy	5	12.2
Muscular Dystrophies	6	14.6
Other NMD*	6	14.6
Medical Complex	26	63.4
Wheelchair-mobile	22	53.7
Use of Nasogastric (NG) or PEG tube	4	9.8
Ventilator support	14	34.1
Using spinal brace or had spinal surgery	8	19.5

*Include peripheral neuropathy (n=2), myotonic dystrophy (n=2), congenital myasthenic syndrome (n=1) and ocular myasthenia gravis (n=1)

Intention of COVID-19 vaccination in patients with NMDs



- **Forty-one patients with NMDs completed both surveys**(Mean age: 13.8 ± 3.4 years old). 60% had medical complex needs (26/41)..
- **Intention on COVID-19 vaccination was higher after the Omicron BA.2 outbreak (97.6% vs 73.3%, p=0.002).**
- **Proportions of vaccination increased from 36.6% (15/41) to 90.2% (37/41) after the Omicron BA.2 outbreak (p<0.001).**
- **Two or more family members vaccinated against COVID-19 was a significant factor on intention [OR : 11.7 (95% CI: 1.81-75.1)].**
- **Twenty patients with NMDs (48.8%) intended to receive BNT162b2 and CoronaVac equally.**
- The two major reasons of vaccination: Concern about to be infected (65.0%) and to protect family (40.0%).

Factors associated with intention of COVID-19 vaccination

Vaccination	Have received or Plan to receive (n=30)	Do not plan to receive (n=11)	p-value
1 family member had COVID-19 vaccine	1 (3.3)	5 (45.5)	<0.001
≥ 2 family members had COVID-19 vaccine	28 (93.3)	6 (54.5)	0.010*
Had received influenza vaccine in previous year	22 (73.3)	5 (45.5)	0.140
Had received influenza vaccine in last three years	24 (80.0)	5 (45.5)	0.052
1 Medical Complex	6 (20.0)	5 (45.5)	0.168
≥ 2 Medical Complex	11 (36.7)	3 (27.3)	0.075

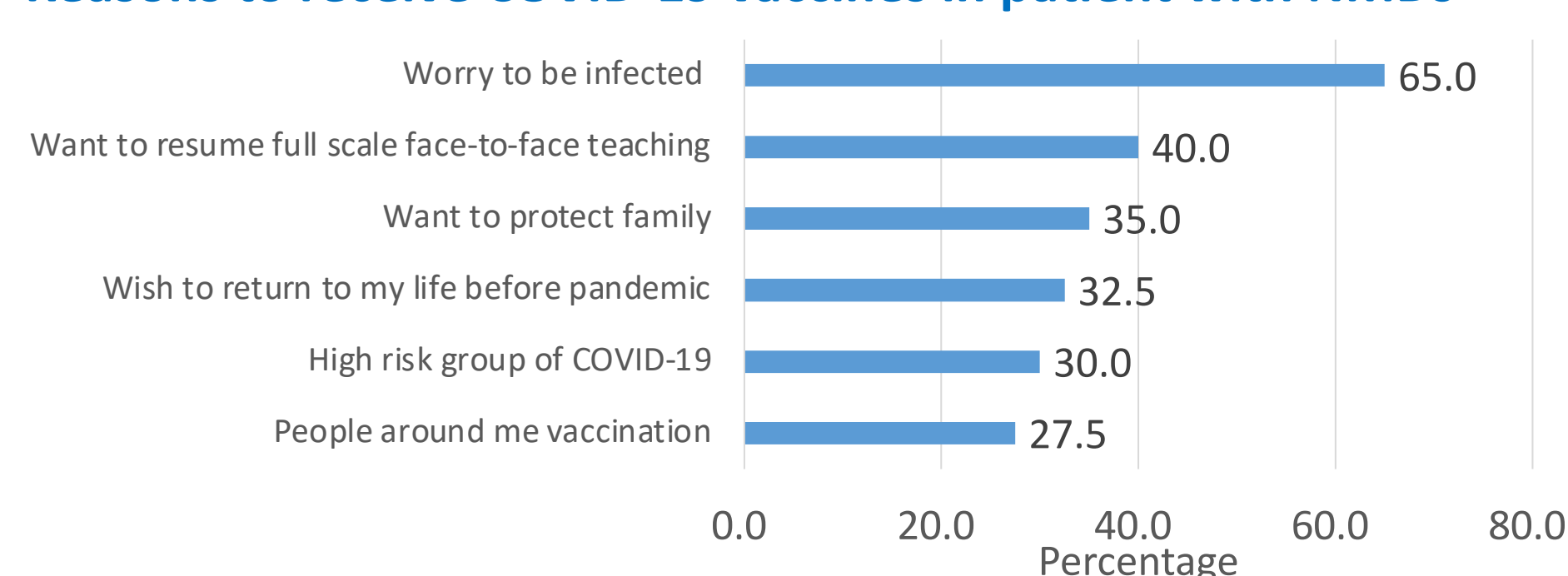
The data is presented as Number (percentage of participants received / plan to receive vaccination OR do not plan to receive vaccination) *Odd ratio =11.7, 95% CI: 1.81-75.1

Preference of COVID-19 vaccines in patients with NMDs

Types of vaccines	Jan 2022			Apr 2022		
	Plan to receive	Already vaccinated	Total	Plan to receive	Already vaccinated	Total
BNT162b2	5 (26.3)	14 (73.7)	19	3 (15.0)	17 (85.0)	20
CoronaVac	8 (88.9)	1 (11.1)	9	0	20 (100)	20
Undecided	2 (100)	0	2	0	0	0
Total	15 (50.0)	15 (50.0)	30	3 (7.5)	37 (92.5)	40

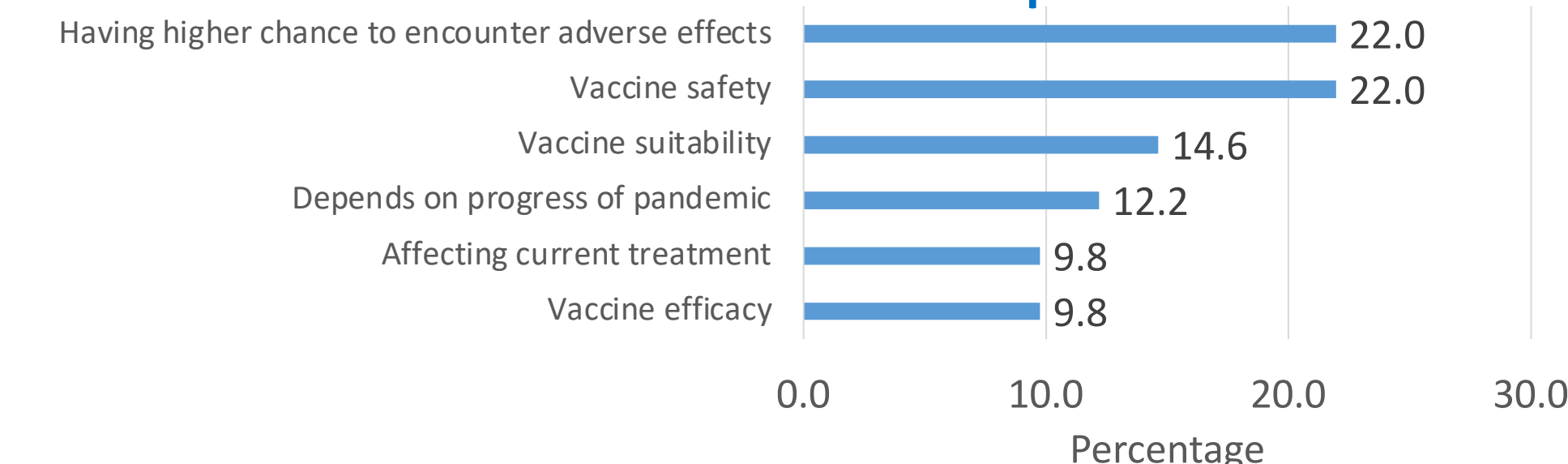
The data is presented as Number (percentage of total participants)

Reasons to receive COVID-19 vaccines in patient with NMDs



RESULTS

Concerns about COVID-19 vaccines in patient with NMDs



- Three major concerns: Higher chance of encountering adverse effects compared to the healthy population (22.0%), safety (22%) and suitability of vaccines (14.6%).

DISCUSSION

- Patients, such as those with NMDs, view themselves as a vulnerable group who are at high risk of COVID-19 but also of adverse effects of COVID-19 vaccines.
- On the other hand, some are concerned about vaccine efficacy.
- More family members receiving COVID-19 vaccination was associated with COVID-19 vaccination in NMD patients.
- Many NMD patients chose to receive the COVID-19 vaccines during a major local Omicron BA.2 outbreak.
- Therefore, counseling on COVID-19 vaccination for patients should include understanding and discussion about their specific concerns, the infection outbreak situation within their surrounding community and vaccination of family members.
- Reactogenicity and immunogenicity of COVID-19 vaccination in vulnerable patients, including those with NMDs, need to be studied and have been planned by our group.

CONCLUSION

Patients with NMDs are a unique patient group that has specific reasons and concerns about COVID-19 vaccination. Clinicians can offer special attention to these factors when counseling NMD patients.

REFERENCES

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- ³Society WM. COVID-19 and people with neuromuscular disorders: World Muscle Society position and advice April 23rd, 2022, 8th Update. Accessed 2021/08/10, <https://www.worldmusclesociety.org/news/view/covid-19-and-people-with-neuromuscular-disorders-world-muscle-society-position-and-advice>
- ⁴Wong WHS, Leung D, Chua GT, et al. Adolescents' attitudes to the COVID-19 vaccination. *Vaccine*. Jan 12 2022;doi:10.1016/j.vaccine.2022.01.010

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