

# COVID-19 Vaccine Hesitancy: Mobile Education Initiatives to Improve Vaccination Uptake among Healthcare Workers

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## ABSTRAK

Keraguan vaksin adalah ancaman global terhadap kesihatan awam yang disebabkan oleh penyampaian dan penerimaan maklumat salah tentang penyakit dan kesihatan. Kajian kami bertujuan untuk menilai kesediaan dan niat untuk menerima vaksin COVID-19 dalam kalangan pekerja kesihatan di satu institusi di Semenanjung Malaysia dan menilai kebolehlaksanaan dan keberkesanan program pendidikan untuk mengatasi masalah keraguan vaksin dalam kalangan pekerja kesihatan. Tinjauan awal kami dalam kalangan 1,616 responden mendapati bahawa 25.3% pekerja kesihatan sama ada enggan atau teragak-agak terhadap vaksinasi COVID-19; 238 responden (58.2%) daripadanya tidak mempunyai kontraindikasi klinikal mutlak. Program pendidikan mudah alih pelbagai aspek telah dilaksanakan melibatkan antaranya (i) siri pendidikan perubatan berterusan (CME) kepada 72 pegawai perhubungan yang dipilih, (ii) sesi taklimat berskala kecil kepada unit individu dan/atau jabatan atas permintaan, dan (iii) sesi kaunseling individu atas permintaan. Program ini mengambil masa lebih empat minggu sebelum pelaksanaan program vaksinasi kebangsaan melibatkan pekerja kesihatan. Penilaian semula penerimaan vaksin COVID-19 dalam kalangan pekerja kesihatan mendapati terdapat pengurangan ketara golongan yang menolak vaksinasi COVID-19 tanpa kontraindikasi mutlak (25.3% berbanding 2.8%). Sebab utama

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*yang diberikan antara mereka yang masih teragak-agak untuk menerima vaksin adalah kerana kehamilan (bukan trimester pertama) dan merancang untuk hamil dalam masa terdekat. Oleh yang demikian, kajian kami menunjukkan keberkesanan interaksi fizikal dan sesi pengajaran dalam menghasilkan komunikasi efektif dan memberikan pemahaman yang lebih baik, terutamanya apabila menangani mitos, maklumat salah dan salah tanggapan berkaitan vaksin COVID-19.*

*Kata kunci: COVID-19, celik kesihatan, pendidikan kesihatan, promosi kesihatan, Malaysia*

## ABSTRACT

Vaccine hesitancy is a global threat to public health contributed by misinformation and lay beliefs about diseases and health. Our study aimed to assess preparedness and intent to receive COVID-19 vaccine among healthcare workers in a single institution in northwest Malaysia and assess the feasibility and efficacy of our mobile education programme to overcome vaccine hesitancy among healthcare workers. Our initial survey among 1,616 respondents found that 25.3% of healthcare workers either refused or were hesitant towards COVID-19 vaccination; 238 respondents (58.2%) of which with no absolute clinical contraindication. Our multifaceted mobile education programme involved: (i) series of continuous medical education (CMEs) to 72 elected liaison officers, (ii) small scale briefing session to individual unit and/or department upon request, and (iii) a one-to-one counselling session upon request. The programme took the course of over four weeks prior to the actual vaccination drive. Re-assessment of intent to receive COVID-19 vaccine found a significant reduction of healthcare workers refusing COVID-19 vaccination without absolute contraindication (25.3% vs. 2.8%). The most common reasons cited among those who were still hesitant were due to pregnancy (non-first trimester) and planning to conceive in the near future. Our study demonstrated the efficacy of physical interaction and teaching session to allow rapid communication and gives better understanding, particularly when dealing with myths, misinformation and misconception related to COVID-19 vaccine.

Keywords: COVID-19, health literacy, health education, health promotion, Malaysia

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## INTRODUCTION

The COVID-19 pandemic significantly affected our socio-economies, education system, lifestyle, and mental

health to a great extent. As with other highly contagious illnesses carrying high morbidity and mortality, a vaccine is crucial to control the disease spread, and perhaps return us to the previous

norm (Thanh Le et al. 2020; Hagan et al. 2021).

Vaccination is an acquired form of active immunisation, producing long term immunity by triggering the innate immune system as well as both arms of the adaptive immune system (Clem 2011) in order to prepare our body against the infection before we actually contract the disease. Vaccines indisputably save lives and dramatically reduce the burden of infectious disease (Slifka & Amanna 2014).

In accordance with the Malaysian government plan for targeted COVID-19 vaccination in the early quarter of 2021, healthcare workers (HCWs) have been named as the forefront of Phase 1 vaccine recipients. The National COVID-19 Immunisation Programme is the largest immunisation programme ever implemented in the history of Malaysia.

According to the Centre for Disease Control and Prevention (CDC), healthcare personnel include persons serving in the healthcare settings, with the potential for direct or indirect exposure to patients or infectious materials (CDC 2020). Therefore, healthcare personnel carry a higher risk of being exposed and contracting COVID-19, hence benefit to be at the forefront of vaccine recipients.

However, social media platforms such as Facebook and WhatsApp hoist significant role in the spread of misconception and myths related to COVID-19 vaccines, seemingly contributing to vaccine hesitancy, even among HCWs. Hence, our study aimed to explore the local preparedness and intent of COVID-19 vaccine uptake

among HCW in a single healthcare facility in northwest Malaysia and assess the efficacy of a mobile education programme implemented by our centre to overcome vaccine hesitancy in our targeted population.

## MATERIALS AND METHODS

### Programme Development

Our methodology was three-fold, including (i) preliminary anonymous survey to assess local preparedness and intent to receive COVID-19 vaccination, which was held four weeks prior to the actual vaccination drive, (ii) structuring a mobile education team driven by trained health and medical personnel to deliver and disseminate credible information with regards to COVID-19 vaccine, and (iii) re-assessment of COVID-19 vaccine uptake during the actual vaccination drive.

### Series of Programme

The COVID-19 Education Team was assembled in collaboration with the institutional Occupational Safety and Health Unit. The team acts as a mobile teaching group to disseminate health information and education related to COVID-19 vaccine and to clear any doubts with regards to vaccine safety and efficacy. The learning material and data were retrieved from the Ministry of Health Malaysia, and the World Health Organisation (WHO) (World Health Organisation 2020).

The programme implemented by the COVID-19 Education Team include the delivery of (i) Continuous

Table 1: Characteristics of study respondents based on intent to receive COVID-19 vaccination

Variable(s)	n (%)	Mean (SD)
Characteristics of overall study respondents (N=1,616)		
Age (years old)		35.8 (7.88)
Unit		
Clinical	1316 (81.4)	
Allied health	108 (6.7)	
Supporting services	165 (10.2)	
Missing data	27 (1.7)	
Characteristics of respondents who refused or hesitant about COVID-19 vaccination (n=409)		
Age (years old)		34.9 (7.01)
Unit		
Clinical	326 (79.7)	
Allied health	12 (2.9)	
Supporting services	61 (14.9)	
Missing data	10 (2.5)	
Characteristics of respondents agreeing to COVID-19 vaccination (n=1,206)		
Age (years old)		36.1 (8.13)
Unit		
Clinical	989 (82.0)	
Allied health	96 (8.0)	
Supporting services	104 (8.6)	
Missing data	17 (1.4)	

Medical Education (CME) to the 72 elected liaison officers from various clinical and non-clinical units and departments, (ii) a total of 13 smaller scale briefing sessions to specific unit and/or department upon request by the head of unit or department, and a (iii) one-to-one counselling session during the actual vaccination drive. The elected liaison officer was also tasked to disseminate CME information to individual unit and department. Such multimodal approach was strategised to maximise information coverage and ensure reliable information with regards to COVID-19 and its vaccine was propagated.

## RESULTS

Our preliminary survey of 1,616 HCWs (out of a total 2,765 HCW) found a quarter ( $n=409$ , 25.3%) of them were either hesitant or refused to receive COVID-19 vaccine (Table 1).

Among those who refused or hesitant about COVID-19 vaccination, 171 (41.8%) had valid clinical contraindication, including (i) early trimester pregnancy ( $n=123$ , 30.1%), (ii) had previous history of anaphylaxis or serious allergy to food, medication, or environmental trigger requiring hospitalisation ( $n=44$ , 10.8%), and (iii) undergoing cancer therapy including chemotherapy, radiotherapy, or immunotherapy ( $n=4$ , 1.0%).

The distribution of the remaining 238 respondents who refused COVID-19 vaccination without valid

## DISCUSSION

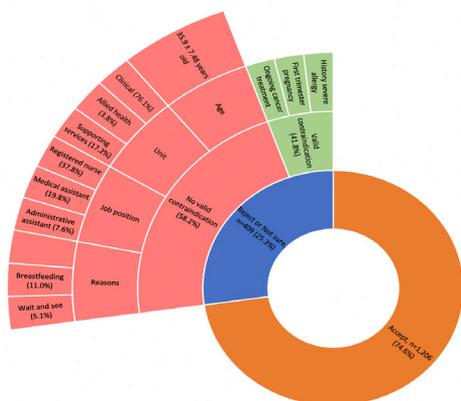


Figure 1: Preliminary survey showing the distribution of COVID-19 vaccine acceptance and common reasons of vaccine hesitancy among HCWs in a single healthcare centre in northwest Malaysia.

clinical contraindication is represented in Figure 1. We also noted that respondents who agreed to vaccination were significantly older ( $M=36.1$ ,  $SD=8.13$ ,  $n=1,206$ ) than those who were hesitant or refused vaccination; ( $M=34.9$ ,  $SD=7.01$ ,  $n=409$ ),  $t(1605) = -2.891$ ,  $p=0.004$ , two-tailed.

The effectiveness of the education module was evaluated based on the acceptance of COVID-19 vaccine during the actual vaccination drive. Upon completion of our first cycle of vaccination programme on March 18<sup>th</sup>, 2021, a total of 2,610 HCWs successfully completed their first injection. Twenty-six reported adverse event following immunisation (AEFI); majority were mild ( $n=13$ , 0.99%). There were 78 (2.82%) HCWs who refused for vaccination without absolute clinical contraindication. A vast majority of them were either pregnant (not in early trimester) or planning to conceive in the near future.

Vaccine hesitancy is prevalent even among HCWs. Our study found that those who were hesitant or refused COVID-19 vaccination were relatively younger than those who readily accepted vaccination. Similar findings were noted among 4,164 Malaysian respondents from a web-based survey, whereby an increasing age was observed as a protective factor against refusal for vaccination (Lau et al. 2021). Despite the reportedly low uptake with other recommended vaccines for HCWs in Malaysia (such as the hepatitis B and yearly influenza vaccines) (Jalil et al. 2015; Omar 2019), the COVID-19 vaccines were probably the most challenged and doubted (Lau et al. 2021). Even so, a recent systematic review on COVID-19 vaccine acceptance had ranked Malaysia as one of the countries with the highest acceptance rate as compared to Russia, United States of America, and several European countries (Sallam 2021). On a related note, a study among 5,009 American adults in mid-2020 found that the two most cited reasons for COVID-19 vaccines reluctance were concerns about safety and its effectiveness- mostly among women and African-Americans (Callaghan et al. 2020)

Denouncing public misconception and myth with regards to COVID-19 and the vaccine development was a critical challenge for our education team as they needed to keep pace with the circulating misinformation cited within the community as well as get credible and reliable information

to debunk the myth and clear the misconception to cultivate confidence and trust among their audience (Zarocostas 2020; Allahverdipour 2020). Efforts to address misinformation from spreading should be pre-emptively dealt with by the health authorities in a timely response (Vraga & Bode 2021). The public should also be vigilant of the legal consequences of spreading misinformation (Daud & Zulhuda 2020), whether ill-intentioned or not.

We have also learned that some HCWs inadvertently misconstrued the COVID-19 information from the mainstream media partly due to the use of certain scientific terms and medical jargon. Indeed, this affected their decision making and made them vulnerable to be tipped by vaccine myths in social media that are typically much easier to understand, validating their fearful emotion (Weerahandi et al. 2018).

Our findings demonstrated the need for multifaceted strategies to disseminate medical knowledge even among HCWs (Zarocostas 2020; Rezende-Filho et al. 2014). Although public engagement via social media platform may be helpful to some extent, physical session proved to be superior in clarifying doubts as a lot of unprecedented questions had been encountered in our setting. A physical session allows participants to channel their questions and get immediate answers regarding any issues related to COVID-19 vaccines while fostering assurance and confidence (Rezende-Filho et al. 2014).

The education programme and

individual counselling session aimed to share reliable, salient, and credible COVID-19 vaccine information, allowing HCWs to make well informed decision prior to vaccination. Our interactive programme improved the accessibility of information, allowing strategic presentation of information as well as strengthening understanding to allow value-concordant choices to be made.

## CONCLUSION

Exposure to decision aids increases knowledge, decreases decisional conflict, and improves abstract decision-making competencies, hence reduces vaccine hesitancy among HCWs. Therefore, we highly recommend facilities to organise targeted education session to improve COVID-19 vaccination coverage for us to champion the pandemic.

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