



Editorial The Effect of COVID-19 Vaccine Acceptance, Intention, and/or Hesitancy and Its Association with Our Health and/or Important Areas of Functioning

Daniel Kwasi Ahorsu ^{1,2,*} and Chung-Ying Lin ^{3,*}

- ¹ Department of Rehabilitation Sciences, Faculty of Health & Social Sciences, The Hong Kong Polytechnic University, 11 Yuk Choi Rd Hung Hom, Hong Kong, China
- ² Mental Health Research Centre, The Hong Kong Polytechnic University, 11 Yuk Choi Rd Hung Hom, Hong Kong, China
- ³ Institute of Allied Health Sciences, College of Medicine, National Cheng Kung University, Tainan 701, Taiwan
- * Correspondence: daniel.ahorsu@connect.polyu.hk (D.K.A.); cylin36933@gs.ncku.edu.tw (C.-Y.L.)

Introduction

The emergence of coronavirus 2019 (COVID-19) has had a significant negative impact on the world, with its effect noted in various areas, such as commerce [1,2], education [3,4], health [5–7], and social life [8,9]. This life-threatening virus, which was first reported in Wuhan (China), was deemed to have a high fatality and infection rate [10,11]. This led the World Health Organisation (WHO) to classify it as a pandemic within three months, on 11th March 2020 [10,11]. Since then, countries worldwide attempted to prevent and/or contain COVID-19 by setting up COVID-19 guidelines or policies such as quarantining, hand washing, and physical distancing [12]. Although effective vaccines have been developed, the negative consequences of COVID-19 remain important issues worldwide. As of 10 January 2023, there had been over 660.1 million COVID-19 cases and over 6.6 million deaths globally [13]. Out of these cases, 270.5 million cases were in Europe, 187 million in the Americas, 109 million cases in the Western Pacific, 60.7 million in Southeast Asia, 23.2 million in the Eastern Mediterranean, and 9.4 million in Africa [13].

The search for an anti-virus (or vaccine) commenced with much urgency, with the first vaccine being approved on 31 December 2020 [14]. As of 12 January 2022, nine vaccines have obtained WHO Emergency Use Listing, including the Pfizer/BioNTech Comirnaty vaccine (31 December 2020); SII/COVISHIELD and AstraZeneca/AZD1222 vaccines (16 February 2021); Janssen/Ad26.COV 2.S vaccine (by Johnson & Johnson, New Jersey, US, 12 March 2021); Moderna COVID-19 vaccine (mRNA 1273, 30 April 2021); Sinopharm COVID-19 vaccine (7 May 2021); Sinovac-CoronaVac vaccine (1 June 2021); Bharat Biotech BBV152 COVAXIN vaccine (3 November 2021); Covovax (NVX-CoV2373) vaccine (17 December 2021); and Nuvaxovid (NVX-CoV2373) vaccine (20 December 2021) [14]. As the only intervention for COVID-19 is the vaccine and behavioural preventive practices, countries worldwide have been conducting studies to better understand their citizens' attitude toward the vaccination and its association with other COVID-19-related variables; social, and/or occupational functioning; health; and other vaccines already in the system. As of 22 December 2022, 13.07 billion doses of vaccines have been administered globally [13]. Out of these 13.07 billion doses, the number of persons vaccinated with the last dose of the primary series was 438.7 million in Europe, 636.8 million in the Americas, 1.7 billion in the Western Pacific, 693.2 million in Southeast Asia, 346.9 million in the Eastern Mediterranean, and 273.6 million in Africa [15].

In the quest to understand and improve the COVID-19 vaccination drive, some researchers assume that some COVID-19-related variables—such as COVID-19 stress, fear of COVID-19, perceived stigma from COVID-19, self-stigma from COVID-19, and believing COVID-19 information—may be helpful in this regard [16–18]. For instance, a study by



Citation: Ahorsu, D.K.; Lin, C.-Y. The Effect of COVID-19 Vaccine Acceptance, Intention, and/or Hesitancy and Its Association with Our Health and/or Important Areas of Functioning. *Vaccines* **2023**, *11*, 368. https://doi.org/10.3390/ vaccines11020368

Received: 12 January 2023 Accepted: 13 January 2023 Published: 6 February 2023



Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). Adjaottor et al. [19] reported that believing COVID-19 information, danger and contamination fears, and traumatic stress (subscales of COVID-19 stress) were significant predictors of COVID-19 vaccination acceptance but not fear of COVID-19, perceived stigma from COVID-19, self-stigma from COVID-19, and COVID-19 infection prevention behaviours. Other researchers have reported interesting findings after examining the association between COVID-19-related variables and COVID-19 vaccination, taking into consideration sex, migration status, and others [20,21].

The mode of transmission of COVID-19 together with its high fatality rate led to the institution of preventive measures by governments, which impacted negatively on our functioning. First, there were lockdowns and quarantining, which restricted people's movement and, consequently, their social, school, and/or occupational functioning [22–24]. Later, as lockdown measures were lifted, physical (social) distancing measures and the compulsory wearing of masks were introduced, which further limited social interactions and access to work/school spaces. This shortfall/challenges accelerated the use of the Internet or online mediums for teaching-learning, working, and social media interactions. Although these preventive measures were intended to contain and prevent the further transmission of COVID-19 infection, they also destabilised the normal functioning of society [22–24]. COVID-19 vaccination was, therefore, seen as one of the possible methods of returning to a state of normalcy. Earlier researchers suggested at least a 70% vaccination record to achieve herd immunity [25]. However, until now, there have been challenges with the vaccination drive. These include vaccination hesitancy and/or the unavailability/inadequacy of COVID-19 vaccines. Closely linked with vaccination challenges is the mutation of the COVID-19 virus limiting, the efficacy of the vaccines. Therefore, future studies may be needed to enhance our understanding of the vaccination drive on our functioning.

The debilitating effect of COVID-19 on physical and mental health has been reported worldwide. There have been various reports of physical health challenges such as fever, cough, breathing difficulty, sore throat, and gastrointestinal symptoms associated with post-COVID-19 infection [26,27]. Moreover, depression, anxiety, insomnia, and substance use disorders have been associated with post-COVID-19 infection [28,29]. There have also been reports of the higher likelihood of older people and people with chronic health conditions (e.g., hypertension and chronic obstructive pulmonary disease) to succumb to COVID-19 infection and mortality [30–32]. A comparative study on physical and mental health outcomes between vaccinated and unvaccinated COVID-19 participants with respect to post-COVID-19 infection may squash vaccination hesitancy and push forward COVID-19 vaccination. There is also a need to study some of the side effects of vaccinations and how to appropriately deal with them.

Prior to the emergence of COVID-19, there were several different types of vaccination drives. Taking this into account, some researchers believed that health officers could utilize these previous vaccination programmes to enhance the COVID-19 vaccination drive. This is also because the influenza vaccination was reported to be negatively associated with COVID-19 infection and mortality [33,34], and both vaccinations improved the physical quality of life [35]. However, a previous study examining the difference between COVID-19 and flu vaccination programmes revealed that flu vaccination rates have been affected after COVID-19 vaccination [36]. A study among the Hungarian population revealed that more participants were willing to receive a COVID-19 vaccine compared to seasonal influenza, even after grouping participants based on demographic data or perceived financial status [37]. Other studies provided different reasons and factors influencing COVID-19 vaccination [19,38–40]. Taking these studies into consideration, there will be a need for more studies examining the intention of receiving different vaccines and attitudes towards those vaccines and the vaccination drive.

In general, the literature above clearly indicates that several factors influence COVID-19 vaccination acceptance. Moreover, COVID-19 vaccination opens the way for us to function socially and occupationally, especially as the COVID-19 vaccine process is ongoing. Furthermore, as some countries are trying to declare COVID-19 as endemic [41–43], some scholars are discussing whether we should treat the COVID-19 vaccine as a flu vaccine. In addition, informational fatigue and misinformation continue to be a challenge. Therefore, COVID-19 vaccine acceptance should be contentiously investigated worldwide. Accordingly, the present Special Issue welcomes any type of investigation on the COVID-19 vaccine through the lens of psychosocial aspects, in order to help the scientific community better understand the issue of the COVID-19 vaccine and vaccination drive.

Author Contributions: Conceptualization, D.K.A. and C.-Y.L.; methodology, D.K.A. and C.-Y.L.; software, D.K.A. and C.-Y.L.; validation, D.K.A. and C.-Y.L.; formal analysis, D.K.A. and C.-Y.L.; investigation, D.K.A. and C.-Y.L.; resources, D.K.A. and C.-Y.L.; data curation, D.K.A. and C.-Y.L.; writing—original draft preparation, D.K.A. and C.-Y.L.; writing—review and editing, D.K.A. and C.-Y.L.; visualization, D.K.A. and C.-Y.L.; supervision, D.K.A. and C.-Y.L.; project administration, D.K.A. and C.-Y.L.; All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest: The authors declare no conflict of interest.

References

- 1. Donthu, N.; Gustafsson, A. Effects of COVID-19 on business and research. J. Bus. Res. 2020, 117, 284–289. [CrossRef]
- 2. Lashgari, Y.S.; Shahab, S. The impact of the COVID-19 pandemic on retail in city centres. Sustainability 2022, 14, 11463. [CrossRef]
- Gómez-García, G.; Ramos-Navas-Parejo, M.; de la Cruz-Campos, J.C.; Rodríguez-Jiménez, C. Impact of COVID-19 on university students: An analysis of its influence on psychological and academic factors. *Int. J. Environ. Res. Public Health* 2022, 19, 10433. [CrossRef] [PubMed]
- 4. Ahorsu, D.K.; Pramukti, I.; Strong, C.; Wang, H.-W.; Griffiths, M.D.; Lin, C.-Y.; Ko, N.-Y. COVID-19-related variables and its association with anxiety and suicidal ideation: Differences between international and local university students in Taiwan. *Psychol. Res. Behav. Manag.* **2021**, *14*, 1857–1866. [CrossRef] [PubMed]
- 5. Fazeli, S.; Mohammadi Zeidi, I.; Lin, C.-Y.; Namdar, P.; Griffiths, M.D.; Ahorsu, D.K.; Pakpour, A.H. Depression, anxiety, and stress mediate the associations between internet gaming disorder, insomnia, and quality of life during the COVID-19 outbreak. *Addict. Beh. Rep.* **2020**, *12*, 100307. [CrossRef]
- Lu, M.-Y.; Ahorsu, D.K.; Kukreti, S.; Strong, C.; Lin, Y.-H.; Kuo, Y.-J.; Chen, Y.-P.; Lin, C.-Y.; Chen, P.-L.; Ko, N.-Y.; et al. The prevalence of post-traumatic stress disorder symptoms, sleep problems, and psychological distress among COVID-19 frontline healthcare workers in Taiwan. *Front. Psychiatry* 2021, *12*, 705657. [CrossRef]
- Ahorsu, D.K.; Lin, C.-Y.; Marznaki, Z.H.; Pakpour, A.H. The association between fear of COVID-19 and mental health: The mediating roles of burnout and job stress among emergency nursing staff. Nurs. Open 2022, 9, 1147–1154. [CrossRef]
- Chaturvedi, K.; Vishwakarma, D.K.; Singh, N. COVID-19 and its impact on education, social life and mental health of students: A survey. *Child Youth Serv. Rev.* 2021, 121, 105866. [CrossRef]
- 9. Al-Sejari, M.M.; Al-Kandari, Y.Y. A changing in social lifestyle for men during the COVID-19 lockdown and its relationship to mental health: Kuwaiti Diwaniyyah as an example. *Am. J. Men's Health* **2022**, *16*, 15579883221089486. [CrossRef]
- 10. Zhang, Y.; Yu, B.; Chen, X.; Rich, S.; Mo, Q.; Yan, H. Dynamics of the coronavirus disease 2019 (COVID-19) epidemic in Wuhan City, Hubei Province and China: A second derivative analysis of the cumulative daily diagnosed cases during the first 85 days. *Glob. Health J.* **2021**, *5*, 4–11. [CrossRef]
- 11. Mohan, B.; Nambiar, V. COVID-19: An insight into SARS-CoV-2 pandemic originated at Wuhan City in Hubei Province of China. *J. Infect. Dis. Epidemiol.* **2020**, *6*, 146. [CrossRef]
- Talic, S.; Shah, S.; Wild, H.; Gasevic, D.; Maharaj, A.; Ademi, Z.; Li, X.; Xu, W.; Mesa-Eguiagaray, I.; Rostron, J.; et al. Effectiveness of public health measures in reducing the incidence of COVID-19, SARS-CoV-2 transmission, and COVID-19 mortality: Systematic review and meta-analysis. *BMJ* 2021, 375, e068302. [CrossRef] [PubMed]
- 13. World Health Organisation. WHO Coronavirus (COVID-19) Dashboard. Available online: https://covid19.who.int/ (accessed on 11 January 2023).
- 14. World Health Organisation. Coronavirus Disease (COVID-19): Vaccines. Available online: https://www.who.int/news-room/ questions-and-answers/item/coronavirus-disease-(covid-19)-vaccines (accessed on 28 December 2022).
- World Health Organisation. COVID-19 Vaccination Dashboard. Available online: https://app.powerbi.com/view?r= eyJrIjoiMWNjNzZkNjctZTNiNy00YmMzLTkxZjQtNmJiZDM2MTYxNzEwIiwidCI6ImY2MTBjMGI3LWJkMjQtNGIzOS0 4MTBiLTNkYzI4MGFmYjU5MCIsImMiOjh9 (accessed on 11 January 2023).
- 16. Kotecha, I.; Vasavada, D.; Kumar, P.; Nerli, L.; Tiwari, D.; Parmar, D. Knowledge, attitude, and belief of health-care workers toward COVID-19 vaccine at a tertiary care center in India. *Asian J. Soc. Health Behav.* **2022**, *5*, 63–67. [CrossRef]
- 17. Rad, M.; Fakhri, A.; Stein, L.; Araban, M. Health-care staff beliefs and coronavirus disease 2019 vaccinations: A cross-sectional study from Iran. *Asian J. Soc. Health Behav.* 2022, *5*, 40–46. [CrossRef]
- 18. Nascimento, M.; Nunes, A.; Juchem, L. "I believe in science and in all vaccines": Older adult and the intention for a vaccine against COVID-19. *Asian J. Soc. Health Behav.* **2022**, *5*, 108–114. [CrossRef]

- Adjaottor, E.S.; Addo, F.M.; Ahorsu, F.A.; Chen, H.P.; Ahorsu, D.K. Predictors of COVID-19 stress and COVID-19 vaccination acceptance among adolescents in Ghana. *Int. J. Environ. Res. Public Health* 2022, 19, 7871. [CrossRef] [PubMed]
- Lin, S. COVID-19 pandemic and immigrants' elevated health concerns in Canada: Vaccine hesitancy, anticipated stigma, and risk perception of accessing care. J. Immigr. Minor. Health 2022, 24, 896–908. [CrossRef]
- Mo, P.K.H.; She, R.; Yu, Y.; Li, L.; Yang, Q.; Lin, J.; Ye, X.; Wu, S.; Yang, Z.; Guan, S.; et al. Resilience and intention of healthcare workers in China to receive a COVID-19 vaccination: The mediating role of life satisfaction and stigma. *J. Adv. Nurs.* 2022, 78, 2327–2338. [CrossRef]
- Hoel, V.; Zweck, C.V.; Ledgerd, R. The impact of Covid-19 for occupational therapy: Findings and recommendations of a global survey. World Fed. Occup. Ther. Bull. 2021, 77, 69–76. [CrossRef]
- 23. Long, E.; Patterson, S.; Maxwell, K.; Blake, C.; Bosó Pérez, R.; Lewis, R.; McCann, M.; Riddell, J.; Skivington, K.; Wilson-Lowe, R.; et al. COVID-19 pandemic and its impact on social relationships and health. *J. Epidemiol. Community Health* **2022**, *76*, 128. [CrossRef]
- Hosseinzadeh, P.; Zareipour, M.; Baljani, E.; Moradali, M.R. Social consequences of the COVID-19 pandemic. A Systematic Review. *Invest. Educ. Enferm.* 2022, 40, e10. [CrossRef] [PubMed]
- Plans-Rubió, P. Percentages of vaccination coverage required to establish herd immunity against SARS-CoV-2. Vaccines 2022, 10, 736. [CrossRef] [PubMed]
- Park, A.H.; Zhong, S.; Yang, H.; Jeong, J.; Lee, C. Impact of COVID-19 on physical activity: A rapid review. J. Glob. Health 2022, 12, 05003. [CrossRef] [PubMed]
- 27. Wang, C.; Tripp, C.; Sears, S.F.; Xu, L.; Tan, Y.; Zhou, D.; Ma, W.; Xu, Z.; Chan, N.A.; Ho, C.; et al. The impact of the COVID-19 pandemic on physical and mental health in the two largest economies in the world: A comparison between the United States and China. *J. Behav. Med.* **2021**, *44*, 741–759. [CrossRef]
- Badinlou, F.; Lundgren, T.; Jansson-Fröjmark, M. Mental health outcomes following COVID-19 infection: Impacts of post-COVID impairments and fatigue on depression, anxiety, and insomnia—A web survey in Sweden. *BMC Psychiatry* 2022, 22, 743. [CrossRef]
- 29. Xie, Y.; Xu, E.; Al-Aly, Z. Risks of mental health outcomes in people with covid-19: Cohort study. *BMJ* **2022**, *376*, e068993. [CrossRef]
- Tam, E.; Kwan, Y.; Ng, Y.; Yam, P. Clinical course and mortality in older patients with COVID-19: A cluster-based study in Hong Kong. *Hong Kong Med. J.* 2022, 28, 215–222. [CrossRef]
- Dadras, O.; SeyedAlinaghi, S.; Karimi, A.; Shamsabadi, A.; Qaderi, K.; Ramezani, M.; Mirghaderi, S.P.; Mahdiabadi, S.; Vahedi, F.; Saeidi, S.; et al. COVID-19 mortality and its predictors in the elderly: A systematic review. *Health Sci. Rep.* 2022, 5, e657. [CrossRef]
- Geng, J.; Yu, X.; Bao, H.; Feng, Z.; Yuan, X.; Zhang, J.; Chen, X.; Chen, Y.; Li, C.; Yu, H. Chronic diseases as a predictor for severity and mortality of COVID-19: A Systematic review with cumulative meta-analysis. *Front. Med.* 2021, *8*, 588013. [CrossRef]
- Amato, M.; Werba, J.P.; Frigerio, B.; Coggi, D.; Sansaro, D.; Ravani, A.; Ferrante, P.; Veglia, F.; Tremoli, E.; Baldassarre, D. Relationship between influenza vaccination coverage rate and COVID-19 outbreak: An Italian ecological study. *Vaccines* 2020, *8*, 535. [CrossRef]
- 34. Conlon, A.; Ashur, C.; Washer, L.; Eagle, K.A.; Hofmann Bowman, M.A. Impact of the influenza vaccine on COVID-19 infection rates and severity. *Am. J. Infect. Control* **2021**, *49*, 694–700. [CrossRef] [PubMed]
- Lin, C.-Y.; Fan, C.-W.; Ahorsu, D.K.; Lin, Y.C.; Weng, H.-C.; Griffiths, M.D. Associations between vaccination and quality of life among Taiwan general population: A comparison between COVID-19 vaccines and flu vaccines. *Hum. Vaccin. Immunother.* 2022, 18, 2079344. [CrossRef]
- Leuchter, R.K.; Jackson, N.J.; Mafi, J.N.; Sarkisian, C.A. Association between COVID-19 vaccination and influenza vaccination rates. N. Engl. J. Med. 2022, 386, 2531–2532. [CrossRef] [PubMed]
- Dombrádi, V.; Joó, T.; Palla, G.; Pollner, P.; Belicza, É. Comparison of hesitancy between COVID-19 and seasonal influenza vaccinations within the general Hungarian population: A cross-sectional study. BMC Public Health 2021, 21, 2317. [CrossRef] [PubMed]
- Tatarkova, M.; Ulbrichtova, R.; Svihrova, V.; Zibolenova, J.; Novak, M.; Svihra, J., Jr.; Hudeckova, H. Secondary school teachers and outpatient physicians: Differences in attitudes towards vaccination against COVID-19 in Slovakia. *Vaccines* 2022, 10, 1858. [CrossRef]
- Cengiz, B.; Sayılır, M.Ü.; Zengin, N.Y.; Küçük, Ö.N.; Soylu, A.R. Does the COVID-19 vaccination rate change according to the education and income: A study on vaccination rates in cities of Turkey between September 2021 and February 2022. *Vaccines* 2022, 10, 1933. [CrossRef]
- Rifai, A.; Wu, W.-C.; Tang, Y.-W.; Lu, M.-Y.; Chiu, P.-J.; Strong, C.; Lin, C.-Y.; Chen, P.-L.; Ko, W.-C.; Ko, N.-Y. Psychological distress and physical adverse events of COVID-19 vaccination among healthcare workers in Taiwan. *Vaccines* 2023, 11, 129. [CrossRef]
- 41. The Lancet Infectious Diseases. Transitioning to endemicity with COVID-19 research. Lancet Infect. Dis. 2022, 22, 297. [CrossRef]

- 42. Choi, J.I. Transition of COVID-19 to endemic phase and emergence of COVID-19 related neuropathic pain. *Korean J. Pain* **2022**, *35*, 237–239. [CrossRef]
- 43. Pontoh, R.S.; Toharudin, T.; Ruchjana, B.N.; Gumelar, F.; Putri, F.A.; Agisya, M.N.; Caraka, R.E. Jakarta Pandemic to endemic transition: Forecasting COVID-19 using NNAR and LSTM. *Appl. Sci.* **2022**, *12*, 5771. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.