Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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ORIGINAL ARTICLE

Willingness to treat COVID-19 disease: What do medical & nursing students perceive?

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Summary
Background. — The COVID-19 pandemic has resulted in many changes in the delivery of health service which not only affect the public as well as healthcare workers, and also among medical and nursing students who are currently undergoing their training. This study aims to determine the commitment and willingness of medical and nursing students in Sarawak in treating patients with COVID-19 and its associated factors.
Methods. — It was a cross-sectional study using online questionnaire, carried out in a public university in Sarawak, Malaysia. All medical and nursing students were invited to participate in this study. Data was entered and analysed using IBM SPSS version 22.
Result. — A total of 304 respondents participated in the study, with 81.6% female and 69.4% medical students. Majority of the respondents were most willing to take a medical history, do a physical examination, throat swabbing, draw blood and perform IV drip insertion. There was a high commitment among respondents to treat COVID-19 patients regardless of personal risks. Majority of the respondents also agreed that medical staff who are involved in treating COVID-19 patients should be receiving a salary increase and compensation should be given to affected healthcare families, and all non-medical staff should be involved in treating COVID-19 patients. About 71% agreed about a law mandating medical staffs to treat patient.
Conclusion. — The willingness and commitment of medical and nursing students to treat COVID-19 patients was high, indicating their potential work force as healthcare providers.

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Background

In healthcare setting, willingness to cure certain diseases regardless knowing the personal risk has been a debatable issue over the years [1]. Past histories showed that in treating infectious diseases such as AIDS, SARS, MERS or currently COVID-19, the reluctance of some healthcare workers to care for patients is not new and uncommon [2,3]. Nevertheless, many healthcare workers would remain behind to care for their patients. Such differences in medical practices cannot be solely derived from patients' right to healthcare but rather a virtuous act of a medical profession in carrying out their role in providing health care [4]. In such, dilemmas arise when the risks increase significantly during an epidemics or pandemic. According to Medical Dictionary for the Health Professions and Nursing [5], willingness is defined as an openness to risk opportunity where a person would be prepared to do under some circumstances. Many studies have been conducted to look into the healthcare workers' willingness to heal patients with infectious disease [6]. The outcome of these studies showed that one of the main contributing factors is the fear of safety to oneself as well as the health care personnel's families [7]. Social stigma on the other hand also plays an important role to the reason for willingness of healthcare workers to carry out their duty. Social stigma as explained by William et al., [8] can undermine the entire health care system and the effectiveness of delivering health care services from treatment to prevention. Stigma not only affect the society but the healthcare workers who undergo tremendous work pressures, harassment and physical violence that resulted many of them suffered from mental stress and psychological suffering [9]. Such situations arise because lack of public education and awareness about the disease. Commitment on the other hand refers to a sense of responsibility and dedication [10]. In healthcare delivery, doctors and nurses' commitment play a very important role in influencing their job performance and outcomes of patients.

COVID-19, the most recently discovered infectious disease was first reported in Wuhan, China in December 2019 [11,12]. It is a disease under the family of coronavirus that caused illness in humans, and possibly in animals. In general, COVID-19 is an acute disease that can be deadly, with a 2% case fatality. However, despite the lower fatality rate, COVID-19 has resulted in more deaths (1871) than both SARS and MERS (1632) [13]. In Malaysia, as of the 5 August 2020, there were 9002 COVID-19 cases including 125 deaths and 8684 cases of recovery reported by the Ministry of Health (MOH) in Malaysia.

As cases increased, healthcare workers are recognized as another high-risk group to acquire this infection [14]. Despite established guidelines in managing COVID-19 patients, deaths among healthcare workers (HCW) from all around the world [15] amidst working fuelled concerns about the health risks posed to contacts of infected patients [16].

Despite the risk faced by healthcare workers, studies by researchers in China, India, and Saudi Arabia had reported more than half of their healthcare workers were willing to work during the COVID-19 outbreak [17—20]. In India, study among the otolaryngologist showed that they are willing to perform emergency procedure on suspected or confirmed COVID-19 patients [20].

Issues regarding willingness to treat infectious disease for medical and nursing students are crucial because after they have completed their study and obtained their practice license, will they able to perform their roles and responsibilities during epidemics or outbreaks of virulent diseases. Many students perceived medical and nursing career as unique and noble where they are given the opportunity to serve fellow human beings more than any other career, but such commitment requires longer hours of working, potential job demand and assignments outside one's normal area of practice [16].

While reports regarding physicians' opinions on such dilemmas is available, research on students' opinions is much more limited and has not been explored, particularly in COVID-19 and Malaysia context. This study explores the commitment and willingness of medical and nursing students in one of the university in Malaysia to treat infectious disease specifically COVID-19. It also determined the factors contributing to willingness to treat patients with COVID-19.

Methods

This cross-sectional study was conducted in Faculty of Medicine and Health Sciences (FMHS), Universiti Malaysia Sarawak, involving medical students and nursing students. Universiti Malaysia Sarawak is one of public university located in Kota Samarahan, Sarawak, East Malaysia. Kota Samarahan is a satellite town, under the Samarahan district in Samarahan Division, Sarawak that provides the medical and education hub for the state of Sarawak. During the time of study, there were 984 students in the faculty (medical students 737, nursing students 247) who were under the movement control order (MCO) declared by the government. These students were either stayed in the campus or went home to their family. During MCO, no physical classes were conducted.

Data was collected using online based questionnaire (google form) from April until September 2020.

The sample size was calculated using OpenEpi Version 3.01 [21]. Using sampling frame of 984, confidence interval of 95%, hypothesized % of frequency of outcome factor of 50%, design effect of 1, anticipated rejected sample size of 10%, estimated sample size was 304 respondents. No sampling was done. All the eligible students were invited to participate. As the total number of student was 984 and the minimum sample size required was 304, the survey ended as soon as the minimum number of sample size was achieved.

The questionnaire was distributed to all eligible respondents via social media or Facebook. All the students of Faculty of Medicine and Health Sciences are active Facebook users as this is one of the platform to access to university teaching and learning activities.

The questionnaire was adopted from Milikovsky et al. [1] and Khalil [22]. The survey explores the commitment and willingness of medical and nursing students to treat patients with COVID-19. The questionnaire consists of Part A: To assess the socio-demographic background of the respondents: age, gender, religion, and programme; Part B: To assess the willingness to perform medical procedures on patients with COVID-19. It consists of 6 items on a 5-point Likert scale ranging from 1 (absolutely not) to 5 (definitely

agree). Rating of 4 and 5 were measured as 'high willingness', a rating of 3 'medium willingness' while for rating of 1 and 2 were measured as 'low willingness'; Part C: The third section of the questionnaire assessed the commitment to treat patients with COVID-19. In addition, the respondents were asked several questions: ''Medical staff treating patients with infectious diseases should receive a salary increase'' with choices of ''yes'' or ''no''. For the risk acknowledgement that affects the commitment of students to treat COVID-19, the respondents were required to select only 1 answer from the choices given such as ''risk of infection'', ''no protection facilities'' and ''others''.

A pre-test was carried out among 30 respondents from year 3 medical students with the aim to improve the questionnaire. Respondents were asked to give feedback on the questions if there were any difficulties in reading and understanding. Feedback from the respondents that they were able to understand the questions asked and it took them about 2 to 3 minutes to complete the questionnaire. The pilot test analysis results showed that the Willingness to perform medical procedures on patients with COVID-19 had a Cronbach's alpha of 0.85 (high reliability) while the commitment to treat patients with COVID-19 had a Cronbach's alpha of 0.5 (moderate reliability) [23]. The questionnaire also underwent content validity by obtaining expert opinion from two professors from the background of medical education and clinical practices.

The collected data was recorded, entered, and analysed using Statistical Package for Social Sciences (SPSS) version 22. A data cleaning had been done beforehand to avoid any abandoned questions or invalid response. Statistical analysis such as descriptive and inferential statistics was carried out.

The study was approved by the Medical Ethical Committee of UNIMAS [Reference number: UNIMAS/NC-21.02/03-02 Jld.4 (100)]. Before obtaining their consent online, the respondents were briefed regarding the research. They were also informed about procedure and the advantages of the research, the confidential of their personal information and their rights to take part or withdraw from this research.

Results

The socio-demographic profile of the study is presented in Table 1. A total of 304 respondents have participated with 81.6% were females. The mean age of the studied sample was 21.5 years (SD 1.62). More than half of the respondents were Muslim. Majority of the respondents were medical students (69.34%).

Table 2 summarised the willingness of the respondents to perform medical procedures on patients with COVID-19. Most of the respondents (91.1%) were most willing to take a medical history and do a physical examination on patients on COVID-19 patients, as well as do throat swabbing (83.6%). When comparing respondents' willingness to draw blood on patients with COVID-19, 82.2% ($n = 250$) were more willing to draw blood. Most of the respondents (76.6%) were willing to perform IV drip insertion, but less than half of the respondents (46.4%) were more willing to perform surgery on patients with COVID-19.

Table 3 represents the factors contributing to commitment to treat patients with COVID-19. It shows 94.4% ($n = 287$) respondents agree with medical staff who is handling COVID-19 patients should receive a salary increase. Overall, 88.2% ($n = 268$) of respondents agreed healthcare provider's family should receive compensation from the state if he/she passed away due to illness contracted from a patient. Interestingly, 92.4% ($n = 281$) agreed that the hospital worker who is not a part of the medical team should have responsibility in combating this pandemic. Out of 304 respondents, 94.1% ($n = 286$) felt that an individual who decided to grow to be a medical doctor should have a normal commitment to treat patients in spite of personal risks. Only 71.1% ($n = 216$) agree with there should be a law mandating medical team to handle patients irrespective of disease.

Table 4 shows the reasons why it might be legitimate to break such a law based on question 5 of the above. The result shows 79.9% of the respondents believed certain situations should not be applied by the law, such as lack pf appropriate protective (56.9%), pregnancy (48.7%), parenthood (18.4%) and marriage (12.5%).

Table 1 Socio-demographic profile of the respondents ($n = 304$).

	Mean (SD)	*n* (%)
Age	21.5 (1.62); min: 18, max: 29	
Gender		
Male		56 (18.4)
Female		248 (81.6)
Religion		
Islam		159 (52.3)
Christian		102 (33.6)
Buddhist		27 (8.9)
Hindu		16 (5.3)
Program of study		
Medicine		211 (69.4)
Nursing		93 (30.6)

Discussion

Based on the results, 98.7% of the respondents expressed medium to high willingness to take medical history and performing physical examination. This result was found to be parallel to the study done by Milikovsky et al. [1] where more than 90% of their respondents (medical students) exhibit medium to high willingness to take clinical history and performing physical assessment on patients with swine flu and HIV. One of the possible explanation is the students may not see themselves as taking a functioning part in patient treatment, rather as a student who is learning new skills. Furthermore, during pandemic, students are not allowed to enter any of the hospital setting that relates to COVID-19 for clinical training. As such, they may not feel the risk involves in treating these highly infectious patients. As for those full time healthcare workers like doctors and nurses, many studies have reported their willingness to treat patients with COVID-19, with provision of proper personal protective equipment (PPE) [17–20]. In order to protect the healthcare

Table 2 Willingness to perform medical procedures on patients with COVID-19 ($n = 304$).

	Willingness (n, %)		
	Low	Medium	High
Taking a medical history and performing a physical examination	4 (1.3)	23 (7.6)	277 (91.1)
Throat swabbing	8 (2.6)	42 (13.8)	254 (83.6)
Drawing blood	9 (3.0)	45 (14.8)	250 (82.2)
IV drip insertion	15 (4.9)	56 (18.4)	233 (76.6)
Performing surgery	68 (22.4)	95 (31.3)	141 (46.4)

Table 3 Factors contributing to commitment to treat patients with COVID-19 ($n = 304$).

		n (%)
1.	The medical staff who is treating patients with COVID-19 should receive a salary increase	287 (94.4)
2.	The healthcare provider's family should receive compensation from the state if the he/she dies due to illness contracted from a patient	268 (88.2)
3.	The hospital employee who is not a part of the medical staff should have responsibility in combating this pandemic	281 (92.4)
4.	A person who decided to become physician should have a moral commitment to treat patients regardless of personal risks	286 (94.1)
5.	There should be a law mandating medical staff to treat patients regardless of disease	216 (71.1)

workers, previous studies had recommended more training, crisis counselling and family preparedness to improve their willingness of healthcare workers to work during pandemic [24,25].

More than 95% of the respondents expressed moderate to high willingness to perform throat swabbing, drawing blood and IV drip insertion (97.4%, 97.0%, 95.0%). One of the possible reasons that such procedures pose little risk of self-injury that expose the performer to high-risk of transmission [1]. Similarly, for performing surgical procedures on patients, only 46.4% of the respondents expressed high willingness to perform the procedure. COVID-19 is a highly contagious disease with an incubation period up to 14 days that can be transmitted human-to-human through direct contacts or beads spread by coughing or sneezing from a contaminated person, without proper protection, surgical procedure can expose the performers the risk of infection [26,27].

The results indicated 92.4% of the respondents agreed that during a pandemic, as part of team spirit, non-medical hospital employee should be together with the rest of medical team to combat COVID-19 hand-in-hand. These findings were consistent with Balicer et al. [24]. Hospitals are relied upon to withstand extensive difficulties during COVID-19 pandemic, including tolerant triage, contamination control, deferring non-emergent surgeries, and growing ICU limits, extra working hours. Withstanding these difficulties, particularly during the pandemic pinnacle, is an ''all involved deck'' imperative. In certain pandemic such as flu, specialist non-attendance is relied upon to be one of the most critical difficulties for emergency clinics [24].

Table 4 Reasons why it might be legitimate to break such a law based on question 5 ($n = 243$).

	n (%)
Lack of appropriate protective equipment	173 (56.9)
Pregnancy	148 (48.7)
Parenthood	56 (18.4)
Marriage	38 (12.5)

The findings also reported 94.4% of the respondents agreed to treat patients with COVID-19 with an increment of monthly salary and 88.2% agreed that healthcare provider's family should also receive compensation if they contracted the disease. Our study is consistent with study by Milikovsky et al. [1] as appropriate financing enables them to work efficiently in clinical settings. Financial reward has always been used as motivational lever as it grants workers' satisfaction and may lead them towards a distinct types of work outputs however should be integrated with other incentives and interventions to balance work approach and qualities [28].

Majority of the respondents also expressed their support that anyone who decided to become physicians should have a moral commitment to treat patients regardless of personal risks and there should be a law mandating medical staff to treat patients regardless of disease. In term of moral issue in numerous grounds, all healthcare workers have a duty to treat all types of diseases. However, unlike any other disease, COVID-19 can spread very fast and is highly contagious, and has the potential to overwhelm and even handicapped a healthcare delivery system in a way that other infectious disease never did, such situation is debatable. As the respondents of this study were medical and nursing students, they

might not aware of the risk in the real situation when they practice as physicians and nurses. The response of this two statement was found to be higher than Milikovsky et al. [1] although in their study, the reason given for their high responses was due to majority of their respondents were students who have undergone compulsory military service that portray high solidarity of the Israeli society.

The study also showed that among the reasons for breaking the mandatory law for not treating the COVID-19 patients was lack of appropriate protective equipment and pregnancy. Daily updated news on deaths of medical and non-medical staffs all around the world in treating COVID-19 patients is increasing. Some medical staffs even resigned from their duty as they are facing scarce of variant resources in regards of the drastic increase of cases causing high-risk of getting infected is high, particularly such exposure can lead to potential transmission to their families and relatives. There is speculation that COVID-19 can be passed from mother to foetus while in utero, such conclusion is still unknown. But the known risk from similar viruses and influenza warrants caution.

Conclusion

The future of our country healthcare professionals is medical and nursing programmes students. Therefore, students' willingness and commitment should be evaluated for improvements if required. Our study concluded that the willingness and commitment of medical and nursing students with respect to COVID-19 were high. Although the study showed a great result, many students neglected the importance of taking risk as a future healthcare worker. Thus, students should learn about self-responsibility and be ready in case new disease emerges in near future. Universities also should expose the students to hospital setting by bringing in more clinical teachings for future preparation.

Limitations

However, some limitations had gained from this study. The studied sample was limited because the survey was carried out in a single university. Therefore, the findings may not be generalized to the whole Sarawak settings. Apart from that, a question-based questionnaire was used and thus may be bias responded. Despite its limitation, this study has given a preliminary understanding about students' willingness and commitment to treat patients with COVID-19 disease.

Ethics committee approval

The study was approved by the Universiti Malaysia Sarawak Medical Ethics Committee.

Informed consent

Respondents were informed about the study, and a written signed consent was obtained from those who participated.

Financial disclosure

None declared.

Author contributions

CWL conceptualised the research idea and design. CBFW, ANZ, ASI, NAAM, NALY, WJ reviewed the literature, collected the survey data. All authors analysed the data, wrote the drafts, approved the final manuscript.

Disclosure of interest

The authors declare that they have no competing interest.

References

[1] Milikovsky DZ, Ben YR, Akselrod D, Glick SM, Jotkowitz A. Willingness to treat infectious diseases: what do students think? J Med Ethics 2012;39:22—6, http://dx.doi.org/10.1136/medethics-2012-100509.
[2] Khalid I, Khalid TJ, Qabajah MR, Barnard AG, Qushmaq IA. Healthcare workers emotions, perceived stressors and coping strategies during a MERS-CoV outbreak. Clin Med Res 2016;14:7—14.
[3] Hsin DHC, Macer DRJ. Heroes of SARS: professional roles and ethics of health care workers. J Infect 2004;49:210—5.
[4] Little MJ, Gordon P, Markham L, Rychetnik L, Kerridge I. Virtuous acts as practical medical ethics: an empirical study. J Eval Clin Pract 2011;17:948—53.
[5] Medical dictionary for the health professions and nursing; 2012 [Retrieved August 12 2020 from https://medical-dictionary.thefreedictionary.com/willingness].
[6] Aoyagi Y, Beck CR, Dingwall R, Nguyen-Van-Tam JS. Healthcare workers' willingness to work during an influenza pandemic: a systematic review and meta-analysis. Influenza Other Respir Viruses 2015;9:120—30, http://dx.doi.org/10.1111/irv.12310.
[7] Martin SD. Nurses ability and willingness to work during pandemic flu. J Nurs Manag 2011;19:98—108.
[8] Williams J, Gonzalez-Medina D, Le Q. Infectious diseases and social stigma. Applied Technol Innov 2011;4:58—70.
[9] Bagcchi S. Stigma during the COVID-19 pandemic. Lancet Infect Dis 2020;20:782, http://dx.doi.org/10.1016/S1473-3099(20)30498-9.
[10] The free dictionary. 2003—2021. [Retrieved March 1 2021 from https://medical-dictionary.thefreedictionary.com/].
[11] World Health Organization. Q&A on coronaviruses (COVID-19); 2020 [Retrieved from https://www.who.int/news-room/q-a-detail/q-a-coronaviruses].
[12] Xu Z, Shi L, Wang Y, Zhang J, Huang L, Zhang C, et al. Pathological findings of COVID-19 associated with acute respiratory distress syndrome. Lancet Respir Med 2020;8:420—2, http://dx.doi.org/10.1016/S2213-2600(20)30076-X.
[13] Koh D. Occupational risks for COVID-19 infection. Occupat Med 2020;70:3—5.
[14] Soo K. Over 100 doctors and nurses have died combating coronavirus across the world. Newsweek; 2020 [Retrieved from: https://www.newsweek.com/coronavirus-deaths-infections-doctors-nurses-healthcare-workers-medical-staff-1496056].
[15] Schwartz J, King C, Yen MY. Protecting healthcare workers during the Coronavirus Disease 2019 (COVID-19) outbreak: lessons from Taiwan's severe acute respiratory syndrome response. Clin Infect Dis 2020;71:858—60, http://dx.doi.org/10.1093/cid/ciaa255.

[16] Malm H, May T, Francis LP, Omer SB, Salmon DA, Hood R. Ethics, pandemics, and the duty to treat. Am J Bioethics 2008;8:4—19.
[17] Wu B, Zhao Y, Xu D, Wang Y, Niu N, Zhang M, et al. Factors associated with nurses' willingness to participate in care of patients with COVID-19: a survey in China. J Nurs Manag 2020;28:1704—12.
[18] Hua Fa, Qin D, Yan J, Zhao T, He H. COVID-19 related experience, knowledge, attitude, and behaviors among 2669 orthodontists, orthodontic residents, and nurses in China: a cross-sectional survey. Front Med 2020;7, http://dx.doi.org/10.3389/fmed.2020.00481.
[19] Almaghrabi RH, Alfaradi H, Al Hesbshi WA, Albaadani MM. Healthcare workers experience in dealing with Coronavirus (COVID-19) pandemic. Saudi Med J 2020;41:657—60.
[20] Banerjee S, Sarkar S, Bandyopadhyay SN. Survey and analysis of knowledge, attitude and practice among otolaryngologists in a state in eastern India in relation to the coronavirus disease 2019 pandemic. J Laryngol Otol 2020;134:696—702.
[21] Dean AG, Sullivan KM, Soe MM. OpenEpi: Open Source Epidemiologic Statistics for Public Health, Version. [Retrieved December 21 2021 from www.OpenEpi.com].
[22] Khalil H. Willingness of Saudi dental professionals to treat Hepatitis B virus-infected patients. Nigerian J Clin Pract 2015;18:247—50.
[23] Hinton PR, McMurray I, Brownlow C. SPSS explained. London: Routledge; 2004.
[24] Balicer RD, Barnett DJ, Thompson CB, Hsu EB, Catlett CL, Watson CM, et al. Characterizing hospital workers' willingness to report to duty in an influenza pandemic through threat- and efficacy-based assessment. BMC Public Health 2010;10:436, http://dx.doi.org/10.1186/1471-2458-10-436.
[25] Yonge O, Rosychuk RJ, Bailey TM, Lake R, Marrie TJ. Willingness of university nursing students to volunteer during a pandemic. Public Health Nurs 2010;27:174—80.
[26] Rothana HA, Byrareddyb SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19). J Autoim 2020;109:102433, http://dx.doi.org/10.1016/j.jaut.2020.102433.
[27] Mahmoud A, Hasan Ibrahim A, Hamzeh A. Surgery during the COVID-19 pandemic: a comprehensive overview and perioperative care. Am J Surg 2020;219:903—6.
[28] Franco LM, Bennett S, Kanfer R, Stubblebine P. Determinants and consequences of health worker motivation in hospitals in Jordan and Georgia. Soc Sci Med 2004;58:343—55, http://dx.doi.org/10.1016/s0277-9536(03)00203-x.