Third Wave of Covid-19 Pandemic: The Prevalence and Sociodemographic Characteristic Among Soldiers in 5th Infantry Division

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ABSTRACT

Introduction: As Malaysia entered the third wave of Covid-19, Sabah became the top state in Malaysia to have the most cumulative positive cases. This affected the readiness of the 5th Infantry Division. The objective of this research was to determine the prevalence of COVID-19 positive cases among the personnel from the 5th Infantry Division. **Methodology:** A cross-sectional study was conducted on positive cases that involved army personnel from the 5th Infantry Division which totaled to 5243 personnel (313 officers and 4930 other ranks) from 13th September 2020 to 31st October 2020. Data was collected by Headquarters of the 5th Infantry Division (Medical Branch) using self-administered questionnaire to determine the rank, gender, age, confirmation test, smoking status, comorbidities, exposure details, places of isolation and symptoms prior to diagnosis. Data collected was analyzed by using Microsoft Excel. **Results:** In this study, the prevalence of COVID-19 among military personnel in 5th Infantry Division is 1.03% (n=54). 90.7% of positive cases affected the other ranks and 100% are male army personnel. 53.7% of positive cases were from the age group of 21-30 years old, 53.7% from 13th Infantry Brigade and 79.6% cases were confirmed by using RT-PCR. Among the positive cases, 79.6% are smoker, 96.3% has no comorbidities, 57.4% were positive after close contact with positive cases, 53.7% were managed in isolation centers in camp and 53.7% were symptomatic prior to diagnosis of COVID-19.**Conclusion**: Although the prevalence of this study was relatively low, constant case monitoring, swift contact tracing with investigations and surveillance order was important to ensure that the operational readiness of the 5th Infantry Division was not affected. Joint effort to curb the spread of COVID-19 ensured that the infection was under control at all time.

KEYWORDS: Covid-19, Military, Prevalence, Sociodemographic, Standard Operating Procedure.

INTRODUCTION

COVID-19 pandemic is a serious global health threat. This illness is caused by a new coronavirus called SARS-CoV-2. WHO first learned of this new virus on the 31st of December 2019, following a report of a cluster of cases of 'viral pneumonia' in Wuhan, People's Republic of China[1]. It spreads through respiratory droplets from person-to-person and contact transmission[2]. Malaysia is also affected by this new virus and the first three cases were reported on 25th of January 2020 which involved 3 Chinese nationals who previously had close contact with an infected person from Singapore[3].
The 3rd wave of COVID-19 in Malaysia began on the 20th September 2020[4]. Report which ended on 31st of October 2020 showed that cumulative cases in Sabah (15048 cases) was 47.7% of the total cases of Covid-19 in Malaysia (31548 cases)[5].

The 5th Infantry Division is one of the divisions under Malaysia Armed Forced and its headquarters is located in Kota Kinabalu, Sabah. There are 3 main formations under the administration of 5th Infantry Division namely 5th Infantry Brigade, 13th Infantry Brigade and Division Troop[6]. Based on the latest data, the 5th Infantry Division has a total of 5243 personnel (313 officers and 4930 other ranks)[7]. The objective of this research was to determine the prevalence of COVID-19 positive cases among the personnel from the 5th Infantry Division from 13th September 2020 to 31st October 2020.

METHODOLOGY

This study was conducted under the area of responsibility of 5th Infantry Division, Sabah. The study design of this research was a cross-sectional study, which looked at the prevalence of COVID-19 infection during the time duration among military personnel. This study also discusses the sociodemographic factors among infected personnel which includes smoking status, comorbid, methods of infection, place of isolation and symptoms on the day of diagnosis among the respondents.

The study population was made up of army personnel under the area of responsibility of 5th Infantry Division which totaled to 5243 personnel (313 officers and 4930 other ranks). This study was started after the report of the first case in 5th Division which was recorded on 13th September 2020 up to 31st October 2020. Sampling was convenience sampling where a self-administered

questionnaire in Malay Language was used to collect information on socio-demographic characteristics and health criteria among all the positive cases of Covid-19 in 5th Infantry Division. Testing for Covid-19 was performed with real time RT-PCR and RTK-Ag using nasopharyngeal swab. In Sabah state, other than RT-PCR as a gold standard to diagnose positive Covid-19, the RTK-Ag was considered sufficient as a confirmation test for Covid-19[8].

RESULTS

Prevalence

In this study, the prevalence of COVID-19 positive among military personnel in 5th Division from 13th September 2020 till 30th November 2020 was 1.03% (n=54). There were 54 cases reported during the duration among 5243 personnel.

Socio-demographic characteristics of respondents

a. Rank

Based on the data collected, it has shown that the positive cases of Covid-19 affects 9.3% (n=5) of officers and 90.7% (n=49) of others rank respectively (Figure 1). Among the others rank most of the cases involved rank of private 38.9% (n=21) and corporal 35.2% (n=19) respectively. For officers, most of the cases involved rank of major which consist of 5.6% (n=3).

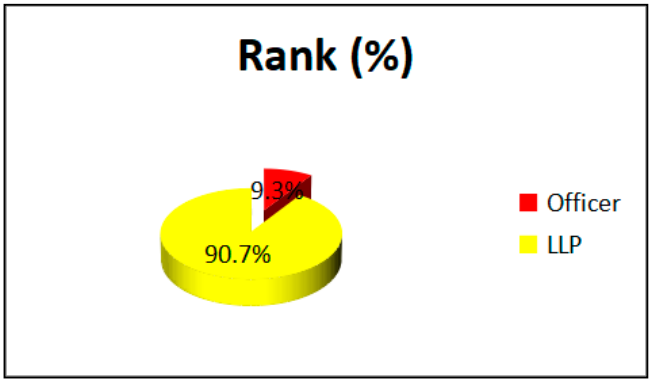

Figure 1: Comparison of Positive Cases of Covid-19 by Rank in Percentage.

b. Gender

Further analysis on gender showed that 100% (n=54) distributions of cases involved male army personnel. Within the study period, there were no cases recorded among female army personnel.

c. Age

The age distribution of positive cases shows that, 3.7% (n=2) are less than 20 years old, 53.7% (n=29) of them age ranging 21-30 years old, 35.2% (n=19) of them age ranging 31-40 years old and 7.4% (n=4) of them age ranging 41–50 years old, respectively (Figure 2). In this study, the youngest army personnel that was diagnosed with positive Covid-19 was 19 years old while the oldest was 47 years old.

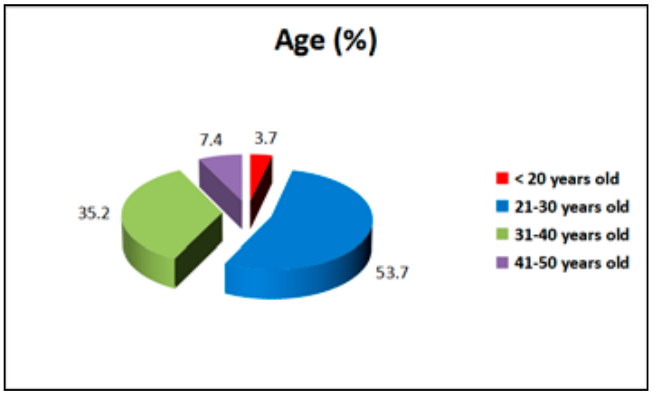

Figure 2: Age Distribution Among Positive Cases of Covid-19.

d. Formation

Over the entire study, we can summarize that 53.7% (n=29) of positive cases were from 13th Infantry Brigade, 29.6% (n=16) of cases from Division Troop and 16.7% (n=9) of cases from 5th Infantry Brigade, respectively (Figure 3). In term of unit that contributed the most cases was from 26 RMR with 29.6% (n=16) (from 13th Infantry Brigade) followed by KA 71 BN KPD (from Division Troop) with 13.0% (n=7) and the third highest was from MSSLK (from Division Troop) with 11.1% (n=6).

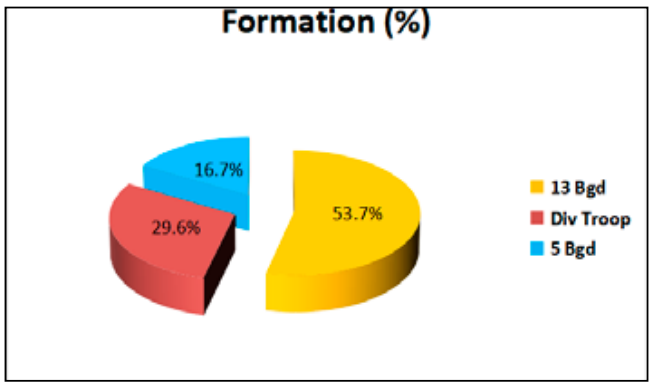

Figure 3: Comparison based on Formation under 5th Infantry Division.

Confirmation Test of Covid-19

With the constraints of laboratories in Sabah which are able perform a large number of RT-PCR tests within a short duration of time, Ministry of Health recommended the use of RTK-Ag test as a confirmation test for Covid-19 in Sabah State only[8]. Data on the Positive Predictive Value (PPV) was 82.7% for the RTK-Ag test which was sufficient to be accepted as a confirmatory test without a RT-PCR test. From Figure 4, we can summarize that 79.6% (n=43) positive cases distributions were confirmed by RT-PCR while 20.4% (n=11) were confirmed by RTK-Ag test.

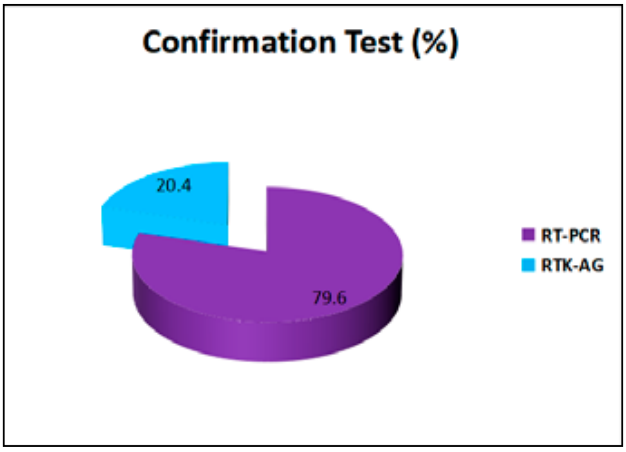

Figure 4: Confirmation Test for Covid-19 by Percentage.

Smoking Status

In this study, we also did a comparison on smoking status among the positive case of Covid-19 and showed that 79.6% (n = 43) of patients were smoker and 20.4% (n = 11) were non-smoker (Figure 5). Smokers were classified as those who used either conventional cigarettes or electronic cigarettes consistently for the past 6 months.

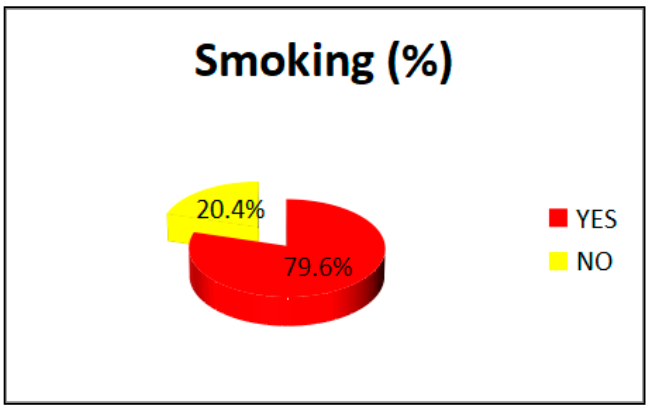

Figure 5: Smoking Status Among Positive Cases of Covid-19.

Comorbids

There were a total of 8 choices of answers for question on comorbidities, which are Type 2 Diabetes Mellitus (T2DM), Hypertension, Ischemic Heart Disease (IHD), Obesity, Dyslipidemia, Asthma, Others and None of Above. Result shows that 96.3% (n=52) had no comorbidities and 3.7% (n=2) have comorbidities. One of them has G6PD Deficiency and the other one has Hepatitis B (under medical follow up). (Figure 6)

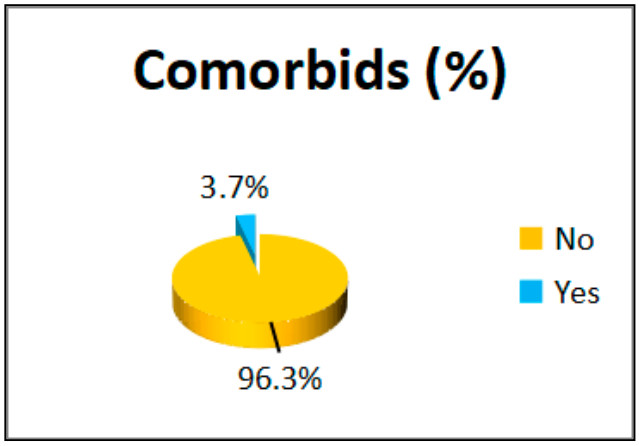

Figure 6: Comorbid Among Positive Case in Percentage.

g. Surveillance

Among those personnel who tested positive, 57.4% (n=31) were infected from close contact to positive case, 24.1% (n=13) of cases were symptomatic screening while 18.5% (n=10) were detected during surveillance screening in camp done by medical team (Figure 7).

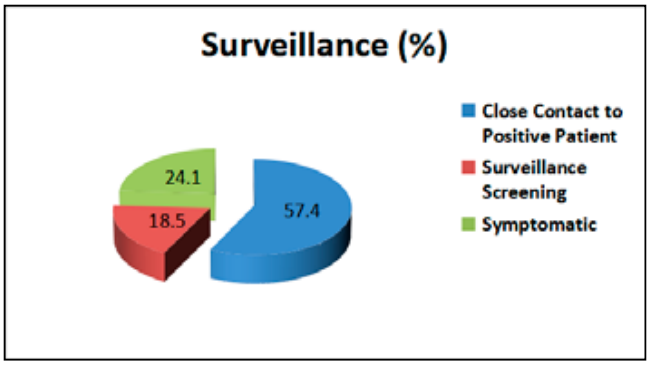

Figure 7: The Reason of Positive Cases Get Infected

h. Places of Isolation

Among COVID-19 positive cases in 5th Division, the most common place for isolation were in isolation centers in camp taking up 53.7% (n=29), followed by 22.2% (n=12) isolated in COVID-19 treating hospital, 16.7% (n=9) were isolated at Low Risk Treatment and Quarantine Center 7.4% (n=4) were isolated in their own house and (Figure 8).

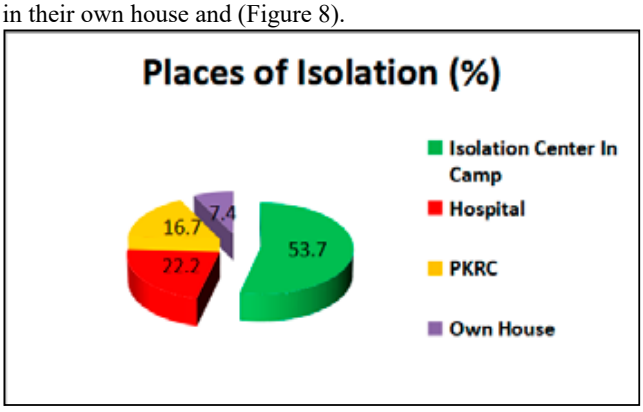

Figure 8: Places of Isolation Among Positive Cases that Involved Army Personnel

Symptomatic on the Day of Diagnosis

In this study, we managed to observe that most personnel were symptomatic before diagnosed with COVID-19. The positive cases were most likely to report at least one clinical symptom of Covid-19 which contributes about 53.7% (n=29) of cases while 46.3% (n=25) were asymptomatic prior to diagnosis (Figure 9).

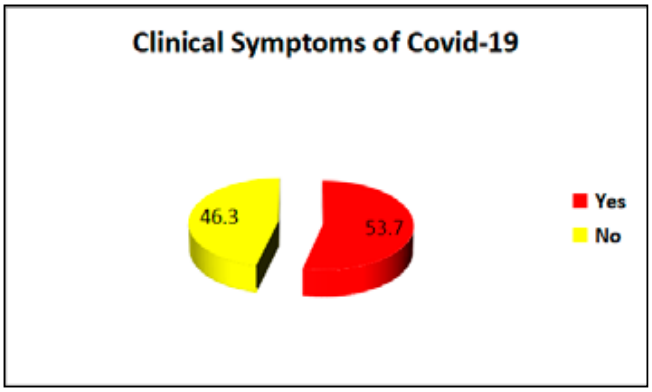

Figure 9: Clinical Symptoms among Positive Case on the Day of Diagnosis

DISCUSSION

Prevalence

In our study, the prevalence was 1.03%. The low prevalence among military personnel in 5th Infantry Division was mainly due to the swift action taken by all responsible parties in ensuring that COVID-19 infection was effectively contained before affecting the bases. In view of military personnel being frontliners protecting our country, we were more robust and aggressive in managing an outbreak or tracing contacts compared to KKM. Frequent testing using RT-PCR or RTK-Ag test for troops who were coming back from operations and leaving for operations were performed, strict quarantine for those returning from red zones, cancellations of all activities and programs that was not a priority and lastly adoption of the new norm which include the usage of mask, video conferencing, hand hygiene and social distancing. Family members of military personnel who were in the base were also required to follow the new Standards of Operation (SOP) for COVID-19.

Rank and Occupational Characteristics

Based on our findings, most of the patients comprise of 90.7% (n=49) of other rank while 9.3% (n=5) are from officers. The statistics gathered from 5th Infantry Division revealed there are 313 officers and 4930 of other rank[7]. Those affected were mainly those involved in operations area which exposed personnel to the surrounding community and environment. They were needed to perform their task effectively despite the ongoing pandemic. Most of the other ranks in our study were those who were performing their task on the ground such as road blocks, patrolling Area of Responsibility (AoR) and dealing with illegal immigrants. This might have contributed to the higher cases among other ranks compared to officers. In one research from United State that was published in April 2020, mentions that occupational characteristics, such as interfacing with the public and being close with other workers, not only put workers at high risk of disease but also as an agent of disease transmission to the community[9].

Gender

In this study, 100% of positive Covid-19 are male. As far as we are concern, most of the military personnel are men but according to NCBL's article by George M. Bwire published on 28th May 2020, men are vulnerable to Covid-19 than women because of several possible factors such as higher expression of angiotensin-converting enzyme-2 (ACE-2); receptors for coronavirus in male than female, sex-based immunological differences driven by sex hormone and X chromosome. Furthermore, it is also influenced by gender behavior (lifestyle) for example higher levels of smoking and drinking among men compared to women. Other studies reported that women had more responsible attitude toward the Covid-19 pandemic than men. Irresponsible attitude among men reversibly affect their undertaking of preventive measures such as frequent hand washing, wearing of facemask and stay at home orders[10].

Age

This study shows most of cases that affect army personnel with age ranging from 20-30 years old with 53.7% (n=29). This corresponds with their occupational characteristics where most of them in this age group are lower ranking personnel and are mostly those who are performing task within the community and environment. This inadvertently exposes them to greater risk of getting COVID-19 infection.

Formation and Red Zone

Among the positive Covid-19 cases, most of the cases were from 13th Infantry Brigade with 53.7% (n=29). If we focused on cases from 13th Infantry Brigade we can see that about 16 cases (29.6%) confirmed Covid-19 cases were recorded from 26 RMR. 6 of them being positive after undergoing symptomatic screening as they reported sick to health clinic and the other 10 are close contact to positive cases. This may be related to the concentration of red zones in the state of Sabah. On 1st November 2020, CPRC listed 30 districts as red zones in Malaysia and 16 districts were from Sabah which are Kinabatangan, Kota Belud, Kota Kinabalu, Kunak, Lahad Datu, Papar, Putatan, Sandakan, Semporna, Tawau, Ranau, Tuaran, Keningau, Kota Marudu, Kudat and Penampang[11] and most of these districts are under the area of responsibility of the 13th Brigade.

Confirmation Test; RTK-Ag or RT-PCR

In this study, shows 79.6% (n=43) cases were confirmed by Reverse-Transcriptase Polymerase Chain Reaction (RT-PCR). Nasopharyngeal swab samples were used for RT-PCR analysis at National Public Health Laboratories, Kota Kinabalu. In one study, sensitivity of RT-PCR in 205 patients varied, at 93% for broncho-alveolar lavage, 72% for sputum, 63% for nasal swabs, and only 32% for throat swabs. Accuracy is also likely to vary depending on stage of disease and degree of viral multiplication or clearance. Higher sensitivities are reported depending on which gene targets are used, and whether multiple gene tests are used in combination. Other review article published on April 2020, from the Director General of Ministry of Health Malaysia, the Rapid Test Kit for Antigen (RTK-Ag) has the advantage of detecting COVID-19 infection in large numbers and in a short time however the RTK-Ag test has a sensitivity of 90%. This means that out of 100 people screened, there may be false negative results for 10 people. Limit of detection for RTK-Ag is currently at Cycle Treshold (Ct) value of 30. Any Ct value above 30 is unable to be detected by RTK-Ag. Ct value of 30 is equivalent to about 300-400 viral copy numbers on the Nasopharyngeal Sample (NPS). As compared to RT-PCR, it involves amplification step and its limit of detection is about 4-5 viral copy numbers[12,13].

Smoking and Covid-19

This study, revealed that 79.6% (n=43) of patients were active smoker. None of the positive personnel were admitted to ICU or diagnosed with severe stage of COVID-19 infection. WHO suggested that smoking is associated with increased severity of disease and death in hospitalized COVID-19 patients. Although likely related to severity, there is no evidence to quantify the risk to smokers of hospitalization with COVID-19 or of infection by SARS-CoV-2. Population-based studies are needed to address these questions. Other larger study that assessed severity, there were higher percentages of current and former smokers among patients that needed ICU support, mechanical ventilation or who had died, and a higher percentage of smokers among the severe cases. However, from their published data we can calculate that the smokers were 1.4 times more likely (RR=1.4, 95% CI: 0.98–2.00) to have severe symptoms of COVID-19 and approximately 2.4 times more likely to be admitted to an ICU, need mechanical ventilation or die compared to non-smokers (RR=2.4, 95% CI: 1.43–4.04)[14,15]. As evidence points, we could conclude that the cases among the 5th Infantry Division did not progress to higher categories because of the age and physical conditions of the personnel involved in this study. More than 80% of the personnel in this study were young and with no comorbids. This played a role in preventing disease progression.

Comorbid and Covid-19

In this study, most of the army personnel have no comorbidities 96.3% (n=52) while the remainder 3.7 %v(n=2) had Hepatitis B on medication and G6PD deficiency. In a journal, published on 25th June 2020, shows that patients with comorbidities have more deteriorating outcomes compared with patients without in term of hospitalization, ICU admission, death and clinical outcomes.

Causes of infection

57.4% (n=31) of patients got infected from close contact to positive cases. Some of the unmarried military personnel stays in a room or dorm which consists of 4 to 6 people per room or in certain condition up to 25 personnel. When 1 of them is infected with Covid-19, the rest of the personnel staying in the same room are considered as close contacts. This is due to the limited capacity of units to provide single isolation rooms for personnel to be quarantined separately. This indirectly increased the susceptibility of personnel contracting COVID-19. In addition to that, some of these personnel have partners working among the community where infection is hard to curb and exposed through their partners.

Places of Isolation

Based on Circular Letter issued by MOH regarding management of Covid-19 in Malaysia, all Covid-19 cases confirmed by laboratory confirmed case should be admitted to the hospital[17]. But in view of bed occupancy of positive cases in most of hospital that receive Covid-19's cases rose up, 53.7% (n=29) had to be isolated in Camp Isolation Centre. While, in certain case, they had to be isolated in their own house where there is high population density and impossible to adhere to the new norm[18]. In order to control the spread of the disease, the medical unit of 5th Infantry Division took part fully and took fast action once a positive case was being notified. All the close contact to positive patients were traced and Home Quarantine Order was issued to them. Their NPS was taken and they had to work from home till their result come out. This is to ensure the cases not being spread in the camp. This was very much easier done among military personnel as they follow orders given and were more compliant to quarantine orders compared to civilians and foreigners in Malaysia.

The other issue in regards is limited space in certain units, thus limit the possibility for separation into small cohorts. As they were quarantined in large cohorts, this led to prolongation of quarantine when positive cases were detected. Each positive case will cause an additional 14 days quarantine for all in the same room and this continued until results were completely negative.

Symptomatic on the day of diagnosis

In this study, shows that 53.7% (n=29) most of the respondents presented with symptoms prior to diagnosis but certain 46.3% (n=25) positive cases shows were asymptomatic. In a study in South Korea published in JAMA Internal Medicine found that 30% of those infected never develop symptoms yet probably spread the virus[19].

CONCLUSIONS AND RECOMMENDATIONS

This was a small scale study that was performed to analyze some basic data and to relay some of the experience gained in 5th Infantry Division. Although the prevalence of positive cases in the 5th Infantry Division was relatively small, a significant number of personnel were unable to continue performing their task when the number of close contacts that were quarantined is taken into account. Constant case monitoring, swift contact tracing with investigations and surveillance order was important to ensure the operational readiness of the 5th Infantry Division was not affected. Joint effort to curb the spread of COVID-19 between the armed forces and the Ministry of Health ensured that the infection was under control at all time. Not to mention the adaptation of new norms by military personnel in their working environment is equally important.

In view of the convenience sampling done in this study, data and respondents were not normally distributed. A wholescale study would enable us to see the associating factors between positive cases and the socio demographic and employment characteristics. A bigger scaled study with randomization should be done in order to scale the true effect of this pandemic to our Malaysian Armed Forces. Cohort study would be a better option.

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