

Education sector risk assessment in the time of pandemic

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ABSTRACT

The study explored school teachers, school administrators, and staff exposure to the COVID-19 virus in the workplace, the risk reduction practices of their organizations, organization response to those workers who were found positive of Coronavirus, and lastly the respondents' suggestions to help their organization protect their employees. The study used a researcher-made risk assessment questionnaire, through Google Forms. The questionnaire was used in 25 selected respondent schools in the Philippines. The study revealed that the majority of the respondents were adopting the work from home, the rest of the respondents are reporting to school 1 up to 6 days a week. There are three major categories in handling the COVID-19 positive person such as implementation of health protocols, support to dimension of wellness, quick and immediate response. Moreover, the top three suggestions of the respondents are: i) Embrace new normal (appointments, enrolment, admission, and other transactions should be online); ii) Regularly provide vitamins, health kits, face masks, face shields, alcohol, and other medical supplies; iii) Provide training and webinars on health, safety training, mental health awareness, and online teaching.

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1. INTRODUCTION

The education system has experienced varied after effects of the Coronavirus Disease outbreak. Coronavirus disease was first named as severe acute respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and later named by the World Health Organization as 2019 Novel Coronavirus Disease (2019-nCoV) or COVID-19 [1], [2]. Researchers found out that health [3], psychological [4], economic [5] are the major aspects of life that academic stakeholders experienced during the pandemics [6]–[11]. Bickley *et al.* [12] confirmed the education sectors were challenged in the new normal, especially the home-based and online learning process. Teachers utilized available virtual learning management systems. But teachers found it difficult to monitor actual student performance [13]. The education sector was given a wake-up call to manage disaster risk assessment in times like this, to ensure the continuity of learning, improved provision, and enhanced education learning systems and capacities without endangering the safety of the faculty, schools staff, and students. The Coronavirus pandemic brought fears to the people that lead to the creation and implementation of standard health protocols among private and public establishments [14]. These protocols ensure the protection of the stakeholders while normalizing the operations of all workplaces.

2. LITERATURE REVIEW

Much still remain unknown about the COVID-19 virus, although we recognize that it is transmitted by direct contact with the respiratory droplets of an infected person. According to Dowdall and Stewart [15], infection can be transmitted by the coughing and sneezing of persons and touching their surfaces contaminated by the virus and rubbing the faces. Although COVID-19 continues to spread, previous researchers [16] suggested that it is important for schools to take action to prevent further spread, reduce the impact of the epidemic [17], and promote control measures [18].

Children are as vulnerable to infection as anyone else, according to a report by Walker [19]. Those aged 6 - 10 in a summer camp were most likely to test for the virus among those aged 21 or younger, with an "attack rate" of 51%. Infection rate was 44% for 11-17 and 33% for 18-21; for staff, mainly young people, total 56%. Moore *et al.* [20] affirmed in their study on the impact of the COVID-19 outbreak that less vulnerable are healthy children and youth.

Previous researchers [21], [22] reminded that management of disaster risk reduction is critical both before and during pandemic. The solution to disaster risk management allows us to respond successfully to disasters and at the same time to lessen the chances of future disasters [23]. It also ensures that our emergency response does not hurt by removing or restoring critical vulnerabilities, especially now that the world is facing a pandemic [24].

The 2015-2030 Sendai Disaster Risk Reduction Framework [25] outlined seven clear targets: i) Reduce global disaster mortality; ii) Lessen the number of people affected by the disaster; iii) Reduce disaster economic loss; iv) Reduce disaster damage; v) Increase the number of countries with disaster risk reduction strategies; vi) Improve global participation; and vii) Increase the availability to multi-hazard warning systems. In addition, the said framework also sets four action objectives to avoid new and existing disaster risks: i) Recognizing disaster risk; ii) Improving disaster risk management to reduce disaster risk; iii) Engaging in disaster resilience prevention; and iv) Strengthening disaster preparedness for an appropriate solution and "Building Back Better" in rehabilitation and recovery. It seeks to reduce disaster risk and damages to life, livelihoods, or the wellbeing of individuals, firms, communities, and countries in significant terms over the next 15 years, as well as in economic, physical, social, cultural, and environmental properties.

Though Stephen *et al.* [26] found out in their literature reviews that at the early stage of the disease outbreak, many nations have shown a preparedness to contain the spread of the 2019-nCoV. These nations include Sweden, Australia, Finland, Canada, Thailand, Denmark, South Korea, and to mention a few. The Philippines was shocked and not prepared for COVID-19 like those countries in previous study [12]. Since students are vulnerable to the virus, the school system in the Philippines has faced numerous educational challenges during this global pandemic [27]. Heightened countywide restrictions resulted in the closure of schools which affected more than 28 million learners from the Philippines and 1.2 billion learners worldwide [28]. Mobility restrictions cause financial loss due to employee layoffs, business freezes, lockdowns [29], [30]. These events manifested a huge difference between and among income groups [31]. Higher-income groups can manage formal credits. While lower-income groups tend to borrow from their relatives and reduce household basic consumption. The difference in access to online learning is not only observed in the Philippines [32], but also in some countries which are also devastated by the coronavirus outbreak [9], [33]–[35]. Khuluqo, Ghani, and Fatayan [36], in their study identified some factors that limits online learning. These factors include internet connectivity and the kind of online learning applications deployed. Other issues identified by Syauqi, Munadi, and Triyono [37] are the different expectations of online teaching and acquisition. Hence, a good disaster risk reduction and management plan will best suit our education system's best solution and action. As suggested previous researchers [16], [38], preparedness, mitigation, response, and recovery are a few of the management approaches to better handle the spread of coronavirus diseases.

In an article of monitoring and evaluation studies [39], disaster risk assessment is a process to determine the nature and magnitude of such risk by evaluating threats and determining existing vulnerability situations that could potentially harm vulnerable persons, properties, infrastructure, livelihoods, and the ecosystem they depend on. Therefore, informed decisions can be made on disaster-reducing measures [39], [40]. Bridging the gap between the pandemic and a successful disaster risk reduction and management plan involves disaster risk analysis and assessment with the help of the stakeholders. This study explored the frequency of exposure of school teachers and staff to people in the workplace, the risk reduction practices of their organizations, organization response to those workers who were found positive of Coronavirus, and lastly the school teachers and staff suggestions to help their organization protect their employees.

2.1. Workers' level of risk exposure

It is important to take note of the level of risk exposure of the workers particularly the industry type and the exposure of physical contact to possible or suspected COVID patients to ensure the protection of the workers while at work. The Institution of Occupational Safety and Health Administration [41] categorized the four risk exposure levels: very high exposure risk, high exposure risk, medium exposure risk, lower

exposure risk as indicated in Figure 1. Workers who have direct contact or very high exposure performing aerosol-generating procedures to identify or suspected source of the virus are classified under very high exposure risk, e.g. healthcare and morgue workers. On the other hand, workers who have high potential exposure like healthcare support, medical transport to identified or suspected sources of the virus are classified under high exposure risk. Further, those whose jobs require frequent contact with unknown or unidentified sources of virus are classified under medium exposure risk, such as in school, plane, or any public places. Workers whose jobs do not require physical contact or only require very minimal contact to the source of the virus can be categorized under lower exposure risk.



Figure 1. Occupational risk pyramid for COVID-19 [41]

The categorization has brought changes in the work arrangements across the globe. In the Philippines, the Civil Service Commission (CSC) set various working arrangements whilst the country was placed in the State of Public Health Emergency due to the widespread coronavirus diseases. CSC encouraged government agencies to adopt and consider the i) Work from home; ii) Skeletal workforce where only a limited number of employees are requested to man the operation of the organizations; iii) Four-day compressed workweek, where a workload of the employees is compressed to four days; v) Staggered working hours, where employees work in 24/7 shifting or flexible working time schedule; and vi) Other alternative working arrangements [42].

2.2. Health protocols

March 11, 2020, when the WHO declared COVID-19 a pandemic. March 17, 2020, the Philippines was placed under six months enhanced community quarantine (ECQ) resulting in the total lockdown of the country. The highest COVID-19 cases were recorded in July 2020 [43]. COVID-19 active cases were reported to surge in South East Asia [44]. This calls for the inter-agency task force for the management of emerging infectious diseases (IATF-EID) to categorize quarantine levels into enhanced community quarantine (ECQ), modified enhanced community quarantine (MECQ), and general community quarantine (GCQ). The IATF was created by the Philippine government by virtue of Executive Order No. 168, s. 2014 mandated to manage infectious diseases. On January 28, 2020, the IATF convened which recommended precautionary measures in the prevention of the spread of the Novel Coronavirus Disease. The IATF recommended stricter health protocols at all times to prevent and slow down the transmission of the coronavirus, e.g., taking of body temperature upon entering to workplace or establishments, providing hand sanitizers, the mandatory wearing of face masks and face shields, social distancing, and other health protocols. Some agencies also provide transportation vehicles and accommodations to the employees who were on essential duties.

2.3. Risk reduction practices in the Philippines

The government has exerted effort to protect its people from this global health threat. On March 28, 2020, an inter-agency task force technical working group (IATF-TWG) headed by the officials of the National Economic Development Authority (NEDA) with official members from various major government agencies. This TWG comprised of the departments of health, agriculture, trade, and education, and the National Intelligence Coordinating Agency are tasked to manage emerging infectious diseases (EID) [45]. The creation of the IATF served as a government's committee to assess, monitor, contain, control, and prevent the spread of any potential epidemic in the Philippines. The IATF-TWG is tasked to assess the impact of COVID-19 and enhanced community quarantine and draft appropriate policy recommendations that will help stimulate the economy and adapt to the “new normal” of economic activity.

The pandemic has brought fright among people and disruptions to the operations of various industries, academies, and other institutions across the globe, thus affecting the global economy [5], [11], [12]. Due to this global crisis, several studies on risk analysis and assessment were conducted to ensure the protection of the individuals against COVID-19 [46]–[50]. In Poland, for example, one significant research was conducted to assess the safety protocols of the workers. The study was conducted in three stages at two-week intervals. Based on the total of 588 responses, approximately 30% of the factory updated their occupational risk assessment, 40% updated their safety protocols, and 90% of the factory equipped their employees with additional personal protective equipment. Researchers concluded that taking additional safety instructions was done to fight against the COVID-19 outbreak [51].

In China, Zhang *et al.* [52], in their article entitled “Protecting healthcare personnel from 2019-nCoV infection risks: lessons and suggestions,” summarized some of the effective measures taken to reduce infection such as improved guidance on the proper use of personal protective equipment, strengthened logistic and medical supplies, and enhanced disinfection. Improved occupational safety was also suggested to lessen the transmission of this infectious disease. Institution of Occupational Safety and Health [53] in the United Kingdom, also released a risk assessment guidance for the workplace. This guide was required to be instituted by the workplace as part of the permission to continue their normal service. Despite standardized guides, Institution of Occupational Safety and Health (IOSH) noted that the risk assessment tool may be different from one workplace to another depending on the context, i.e., “who is doing what and how, where they are doing it, why they are doing it and what they are using” [53].

In the United States, the Occupational Safety and Health Administration conducted a risk assessment on American workers. Results show that most of their respondents are likely categorized in the lower exposure risk or medium exposure risk levels. In the Philippines, representative Stella Luz A. Quimbo and her colleagues conducted a study on the risk assessment on the COVID situation. They formulated a Quimbo-Latinazo-Peabody (QLP) [54] risk indicator which has two dimensions, such as: i) The risk of virus spread; and ii) The risk of over-burdening the health system. Results also show that four effective safety measures are imperatives in the midst of the pandemic, including: i) Social distancing protocol; ii) Contact tracing and quarantine; iii) (Provincial) border control; and iv) Area-based and work-based mass testing. The researchers suggested that there should be a regular reassessment of the risk classification for the strategic reopening of the company [54].

All countries are greatly devastated by the spread of COVID-19 with hundreds of daily infections with a very low recovery rate. This pandemic affects the livelihood of the people, created employment layoffs, and adds up to poverty among the Filipinos. It affects the Philippine economy and social and emotional well-being. This observation of the researchers is supported by the vicarious experiences of the people. The review on social-economic implications of COVID-19 conducted by Nicola *et al.* [55] also enumerated such economic effects of this global health risk. The World Health Organization (WHO) declared COVID-19 caused by severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) a pandemic risk leaving a detrimental risk to the global health system affecting human lives [56], [57].

Aside from economic risk, previous researchers [5], [58] reminded of the needs of the health care workers while also risking lives due to unpredicted sources of virus infection. Gabrielson, Kohn, and Clifton [58] also added that this abrupt healthcare necessity would result in a urology match. They referred to the urology match of providing student interns exposure to their related-medical fields preparing them to become health workers based on their rich medical experiences.

While the government is ensuring all individuals be vaccinated, institutions both private and the public are requested to institute a protocol that could prevent the spread of the COVID-19 virus. At the same time, it protects the welfare of the employees. Among the common health, protocols are social distancing [59], personal hygiene and sanitation [60], implementation of unified curfew hours (Metro Manila mayors agree on ‘unified’ curfew from 8 p.m. to 5 a.m., work arrangements [42], and wearing of face masks [18]. It is for this reason that the current study was conducted to solicit specific risk reduction practices of the individual organizations provided for their employees.

3. RESEARCH METHOD

The researchers randomly chose 25 schools in the Philippines. These respondents are school administrators, teachers, and staff in the Philippines. Another criterion is that the respondent is part of a school environment. The structured survey is the main instrument of the study. The data were collected using the risk analysis of plans for disaster risk reduction management during and after the pandemic. The risk analysis was modified from the Sendai Framework for Risk Reduction Plan [25]. The outcomes of the practices were validated through interviews and disaster risk reduction and management (DRRM) plans of officials. The data collected were thoroughly analyzed using the standard coding process to develop an automated clustered response classification.

4. RESULTS AND DISCUSSION

4.1. Risk analysis in selected schools in the Philippines during the pandemic

Using risk analysis aims to enhance the importance and priority of disaster prevention and preparedness which is critical both before and during this pandemic. Hence, risk analysis for vulnerability to chosen teachers and staff at the school was employed in this study. Based on Occupational Safety and Health Administration (OSHA) [53] category of exposure risk, those whose jobs require frequent contact with unknown or unidentified sources of virus are classified under medium exposure risk, i.e., in schools, planes, or any public places. In this case, only the school heads are exposed to medium risks since they are required to report once or twice a week. On the other hand, those who are categorized as low risks are the teachers who are not required to report but can go to school for a very important reasons, e.g., printing of instructional materials and encoding of online requirements. While there is no high-risk exposure in most schools because this type of a vulnerable category is only for employees in the medical fields like hospitals and health centers. As seen in Figure 2, there were 65% of respondents that are not exposed to people at work because of the work from the home (WFH) scheme of the government for public school teachers and staff. There are 31% of school teachers and staff are exposed to people at work. These are part of the Skeleton (Skeletal) Workforce of their school. Of the 644 of the respondents, about 3% are sometimes revealed to employ the work from school and other days from their home, and 1% of them lost their job during the pandemic.

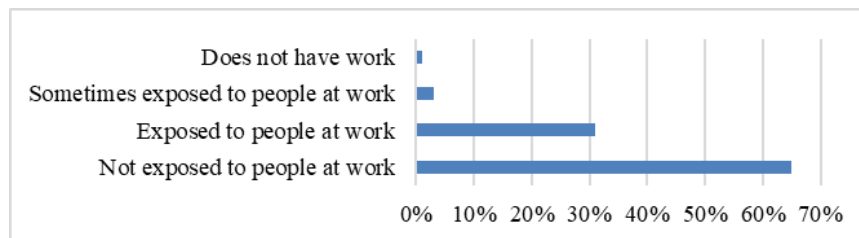


Figure 2. Risk analysis for vulnerability to selected school teachers and school employees during the pandemic

Findings reveal that the government initiatives to implement work from home/skeletal schemes during the quarantine period from March to September were parallel to the respondents' answers. Data only show that the government has done initial steps to slow down the transmission of COVID-19. Figure 3 shows that 247 teachers and staff are not reporting at school and are using the work from the scheme. Moreover, 148 teachers report to school at least once a week, and 106 reports seldom report to school only if needed. On the other hand, 143 respondents did not respond. According to the Institution of Occupational Safety and Health Administration [53], teachers and staff who report to school are at medium risk of exposure to the virus. While those teachers and staff not reporting to school and working from home have a low risk of exposure to the virus. The higher the exposure of teachers and staff to people at school and community, the higher the risk of exposure to the virus.

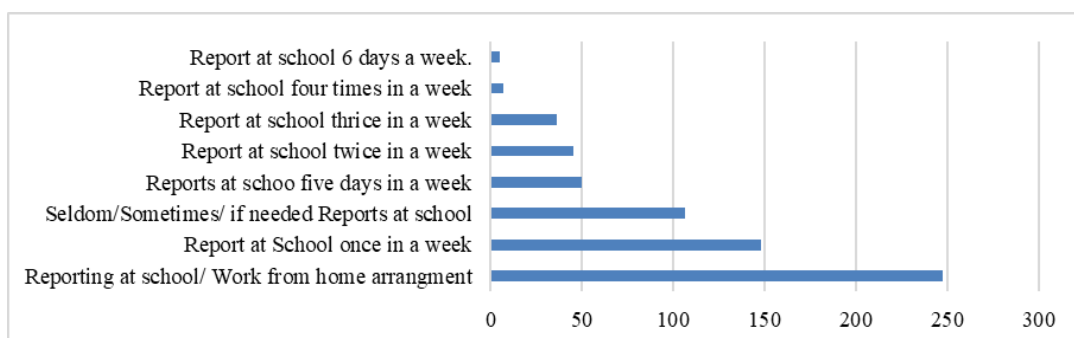


Figure 3. Exposure to people at school by teachers and school staff

4.2. Risk reduction practices in the Philippines

The current study resulted in the following opinions provided by the 644 employees from the 25 participating schools in the Philippines. Results from the analysis of the collected responses, the saturated data are seen in Figure 4. As gleaned from the presented data, social distancing is the first risk reduction practice. This practice does not entail cost, rather self-discipline and a shared sense of inclusion concerning protective measures against the COVID-19 outbreak [59]. Work-from-home, skeletal-workforce, and alternative work arrangement are among the common provisions for risk reduction practice which were also identified by civil service commission memorandum circular (CSC MC) [42]. These pertain to how government agencies employ the recommendations from the IATF and civil service rules and regulations to protect the welfare of their employees.

However, the result of the study shows no mention of the provision of financial assistance to its employees. This could be any form of additional compensation during this pandemic. Financial assistance for the additional utility bills like internet data, electric consumption, procurement of gadgets, and other work-from-home facilities and materials. Especially for teachers who will be conducting blended learning modality. Hence, this paper recommends that the concerned officials should look into this as a necessity to augment every affected employee of their economic struggles due to the inflation of goods and commodities amidst COVID-19.

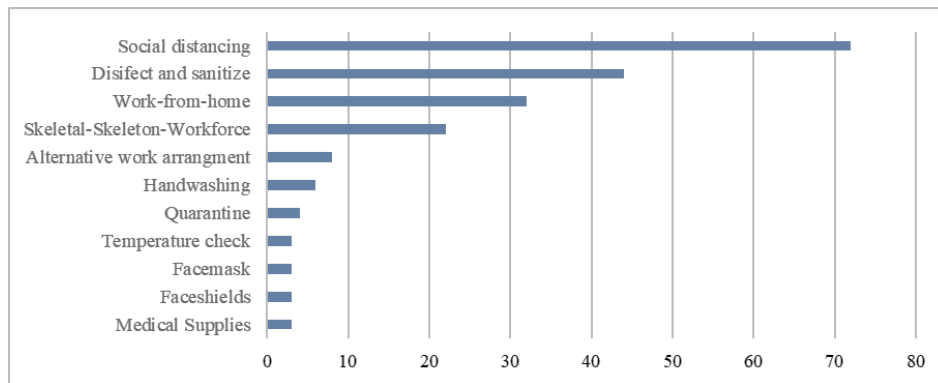


Figure 4. Risk reduction practices of public organizations in the Philippines

4.3. School or organization response to infected employees

Based on the responses from the respondents, the researchers came up with three major ways of handling the emergence of positive case(s) among employees. They are: i) Implementation of health protocols; ii) Support to dimension of wellness; and iii) Quick and immediate response. Figure 5 reveals that 65% of the respondents suggested that the Implementation of Health Protocols should be the top priority of the school or organization in the event of the emergence of positive cases(s) among the employees. The figure also shows that 25% of the respondents recommended the implementation of support the dimension of wellness. Hence, 10% of them recommended a quick and immediate response from the school or organization.

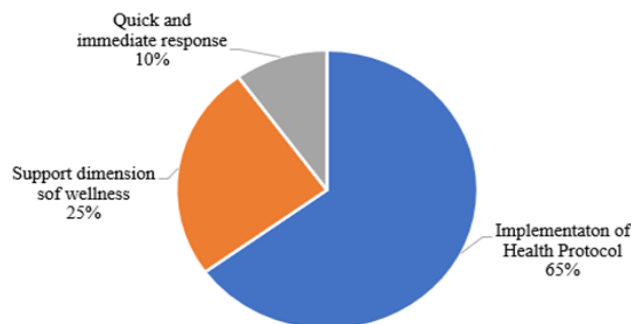


Figure 5. School or organizations response to COVID-19 infected employees

4.4. Educators' response against COVID-19

The prevalent occurrence of the COVID-19 virus presents an unpredicted, unprecedented, and unparalleled major challenge to the workplace, specifically the schools and organizations. This fact is affirmed by Bickley *et al.* [12]. To contain the spread of the virus and to mitigate the increase rate of infection of the COVID-19 in the school or organization, the latter must have a concrete program or framework on how to respond to those people who tested positive as shown in Figure 6.

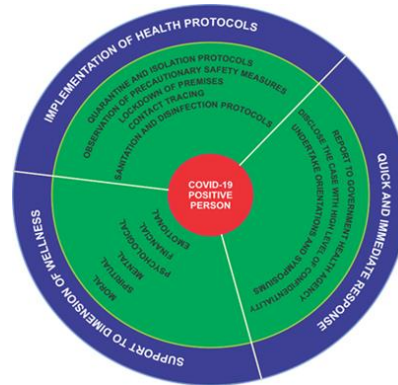


Figure 6. Educators' response against COVID-19

4.4.1. Implementation of health protocols

Under this category, 47% of the total respondents suggested that quarantine and isolation protocols must be fully implemented while 32% of the total respondents indicated that observation of precautionary safety measures and lockdown of premises is one of the best possible responses to the people found positive to COVID-19. Lastly, 21% of the total respondents recommended contract tracing and sanitation, and disinfection of workplace protocols. The mentioned parameters must adhere to the context of COVID-19 operational guidelines and protocols as suggested by the World Health Organization [18], [53] and have been localized and adopted by the Philippine government based on the country setting and present predicament.

4.4.2. Support to dimension of wellness

Support for the dimension of wellness is a category that can be considered as an integral part of handling people found positive to COVID-19 wherein the school or organization's management must carefully execute. With respect to the respondents' overview and suggestions the percentage were moral and emotional (37%), spiritual (21.5%), mental (18%), psychological (13%), and financial (10.5%) factors. This category must be considered integrally to continue the healing process of people found positive to COVID-19.

4.4.3. Quick and immediate response

With a sense of urgency, the researchers recognized that in handling COVID-19 positive people in school or organization- the management team must have a quick and immediate response. As tallied, 58% of the total respondents suggested that reporting the scenario to the government health agency, 31% of the total respondents wanted to disclose the case with a high level of confidentiality so that everyone is fully informed. Hence, 11% of the total respondents would like to undertake orientation and symposium to raise awareness. These recognized factors are the result of the health emergency scenario and tight containment of possible contamination and spread of the virus. Also, the management team of a school or organization must have to interfere with equally unprecedented measures and quick responses to offer possible actions to prevent and to mitigate the increase of infection rate. Table 1 presents the suggestions of the "School Employees" to prevent COVID-19 exposure and accepts the challenge of the "New Normal."

Table 1 presents the suggestions of the respondents to help their organization protect their employees. Based on the obtained 644 responses, the majority believe that embracing the new normal was the best way to protect not only the employees but also their clients. Embracing the new normal would mean that all transactions may be done online which was displayed in item 5 on the table ($f=138$, rank 1). Physical transactions are mostly replaced by the virtual realm due to the fear of contracting the virus outside [13]. The finding is also similar to the previous study [61]. It concluded that Asia Pacific preference to digital transactions is almost 80 %, compared to the global average of 68%.

Table 1. Suggestions to help the organization protect the employees

No.	Suggestions	f	Rank
1.	Provide training and webinars on health, safety training, mental health awareness, and online teaching.	86	3
2.	Be stricter with the implementations of safety measures such as wearing of masks/ face shields, regularly disinfecting of common areas, social distancing	61	5
3.	Enhance the working scheme of the employees to prevent the transmission of the virus	76	4
4.	Subject all employees for mandatory testing especially to those who regularly report for work	36	7
5.	Embrace new normal (appointments, enrolment, admission, and other transactions should be online.)	138	1
6.	Provide allowance for data and electricity or technology that will be useful while working at home	54	6
7.	Regularly provide vitamins, health kits, face masks, face shields, alcohol, and other medical supplies	94	2
8.	Provide transportation services to employees especially those who are commuting	21	10
9.	Regularly check the health of the employees	30	9
10.	Have a concrete plan in case of emergencies and deaths	34	8
11.	No Answers	12	11
12.	Others	7	12

Second in rank was item 7 which states that the organization should “regularly provide vitamins, health kits, face masks, face shields, alcohol, and other medical supplies” (f=94, rank 2). The International Labor Organization has detailed that 2.7 billion people (81% of the world's workforce) had been affected by lockdown measures. It was happened due to this social security measures are regularly insufficient, with a need to access healthcare bolster and financial assurances [62].

This item was followed by item 1 in which respondents suggested to continuously “provide training and webinars on health, safety training, mental health awareness, and online teaching” (f=86, rank 3). Other 76 respondents agreed that organizations should “enhance the working scheme of the employees to prevent the transmission of virus” (f=76, rank 4). The fifth suggestion was to “be stricter with the implementations of safety measures such as wearing masks/ face shields, regularly disinfecting common areas, and social distancing.” Findings are also similar with previous study [51] in which it was recommended to upgrade the safety protocols and to take additional safety instructions to fight against the COVID-19 outbreak.

On the other hand, more than 50 respondents recommended the additional allowance for data and electricity or needed technology that is needed while working at home (rank 6). Other respondents suggested subjecting all employees to mandatory testing (f=36, rank 7), have a concrete plan in case of emergencies (f=34, rank 8), regularly check the health of the employees (f=30, rank 9), provide transportation services to employees especially those who are commuting (f=21, rank 10). Unfortunately, 11 respondents did not provide answers. Other suggestions from seven respondents were to protect the students' rights and health, provide free anti-pneumonia vaccines to the employees, and delay the opening of the class. It can be noted that to protect the personnel and employees, all lessons and insights regarding the effective safety measure against COVID-19 that were provided by many nations should be considered to lessen the transmission of this infectious disease.

5. CONCLUSION

As part of the government's initiative to stop the spread of the virus, there are more school employees adopting to work from home alternative work arrangements lessen the risk to be exposed and to spread the COVID-19 virus and a face-to-face attendance on the need basis only. There were three major categories in handling the COVID-19 positive person, such as: i) Implementation of health protocols; ii) Support to dimension of wellness; iii) Quick and immediate response. The top three suggestions of the respondents are: i) Embrace new normal (appointments, enrolment, admission, and other transactions should be online); ii) Regularly provide vitamins, health kits, face masks, face shields, alcohol, and other medical supplies; iii) Provide training and webinars on health, safety training, mental health awareness, and online teaching. Hence, the result of the current study may serve as the basis of the government and other institutions to prevent the spread of COVID-19. Likewise, the researchers advised each one to be vaccinated for susceptibility to the infection and to at least help achieve the so-called “herd immunity.”

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