Evaluation of Knowledge, Attitudes, And Practices Regarding Post COVID 19 Complications (Physical, Biological), And Immunization Practices in Hawler Medical University, KR, Iraq

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Abstract: The purpose of this program evaluation is to assess community knowledge, attitudes, and practices (KAP) regarding complications of COVID 19, and immunization practices after the COVID 19 infection as part of the impact evaluation of the effects of COVID 19 infection.

Cross-sectional a total of HMU employers and students sampled for survey participation. Verbal consent and by website consent to obtained from all study participants. study revealed that COVID 19 infection in female was higher than males. The highest percentage of the patients was inthe age group (19-29) which represent about 24.6%, most of the COV ID infection acquired by direct contact 56.5%, the highest percentage of infection was in those individual with blood group A (34.5%), fever was recorded in 85.2%, fatigue (81.1%) and cough (60.7%), 89.30 % of patients complained of fatigue, 56.60 % of patient complained of loss appetite and only 18% developed Acute respiratory distress.

Key words: COVID-19, Fever, Complications, Survey, Acute Respiratory Distress

1. Introduction

In the last month of 2019, pneumonia cases were reported resembling the SARS outbreak in 2003 with an unknown etiology occurring in a seafood market in Wuhan, Hubei province, China. (Wu et al., 2020). This unidentified pneumonia caused morethan 80,000 cases in china and was thought to be caused by a new type of coronavirus(COV) called 2019-NCOV. (Zhu et al., 2020). On January 30th, 2020, the world health organization (WHO,2020) reported that the current situation was a "public health emergencyof international concern. (Li et al., 2020A). The responsible pathogen wasnamed as severe acute respiratory syndrome-coronavirus 2(SARS-COV-2) by the international committee on taxonomy of viruses. (Jin Y, Yang H, 2020). And on February 11th, 2020, this new coronavirus pneumonia was named as coronavirus disease-2019 (Covid-19). (WHO, 2019)

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2. Materials and Methods

2.1 Lead Institutions, Investigators, and Roles

Principal investigator and role [Team of this survey Dr. Sahar Mohammad Zaki, and Dr. Fatiheea F Hassan], [HMU], [Erbil-KR-Iraq], they were responsible for protocol development and submission for approval, training preparation, coordination of survey

implementation, and edit and publish of this article, and dr.Omid Sabir were responsible for data analysis, report writing.

2.2 Justification for the Survey

Information collected through this program evaluation provided essential information to help (1427) evaluate the impact of effects of COVID 19 infection and physical complications

2.3 Intended/Potential Use of Survey to Findings

Potential used of findings is to inform program decisions related to OVID 19 physical and biological complications

2.4 Specific Objectives

this survey targeted all employers and students in (HMU, Erbil, Iraq) where they infected by COVID 19. This includes approximately (122) employers and students effected from total number of employers and students approximately (5207) in HMU.

		No.	%
Position	Academic staff	49	40.20%
	Employer	12	9.80%
	Student	61	50.00%
Gender	F	77	63.10%
	M	45	36.90%

2.5 Survey Design

One independent, cross-sectional surveys were conducted in a representative sample of all employers and students in HMU. The survey was take place after infection of COVID 19 and was useful to know the physical and biological complications of COVID 19 and immunological state after infection.

2.6 Sample Size

To calculate sample size, we measured percentage of each complication: hypertension, Asthma, Acute respiratory syndrome, Diabetes, loss of taste and smell, urinary tract infection, uremia, loss of memory, anemia, fatigue, depression, insomnia, loss of appetite, loss of weight, cardiac disease, hypothyroidism, hyperthyroidism.

We propose to proportionally allocate colleges of HMU and compare the number of infected persons with the total number of employers and students in HMU is

2.7 Colleges Selection

Within a selected college at HMU, survey teams will start with the first college at the beginning of above table. Interviewers will then coverage all the colleges with research center

2.8 Enrollment and Consent

All colleges employers and students of HMU will be eligible for participation in the survey. Invitation to participate will be extended to the deans of all colleges and Vice chancellor of HMU. The survey will be administered to persons consenting to participate, and small number will be interviewed face to face and the remaining large number of HMU will response to the survey online.

Prior to conducting the interview, the purpose of the study will be explained in (English and Kurdish) based on the preference of the respondent using a script included in the consent form to ensure consistent wording. The respondent will be given the opportunity to ask questions at any time. Verbal consent to participate in the survey will be obtained from the person selected for interview (Appendix 1). Waiver for signed consent will be requested since the evaluation presents no more than minimal risk of harm to subjects and involved no procedures for which written consent is normally required outside the evaluation context. Personal identifiers will not be collected which will ensure confidentiality. The link of our survey form kink was:

https://docs.google.com/forms/d/1bgjg_cNdrbegogvm2MR7nyPURKa5iHtV6SmE3RMEGeg/edit

2.9 Data Collection

Data collection were conducted using a standardized questionnaire. Questionnaires obtained data on demographic and socioeconomic, and knowledge, attitudes, and practices regarding protection from COVID 19, and history of infection by this virus with complications if occur.

All data were collected by trained project personnel. The survey instrument was translated into (English and Kurdish). No biological specimens were collected. The data collection methods pose no risk to survey participants. Personal identifying information weren't collected.

2.10 Quality Control Measures

All data collection was monitored and reviewed daily by both researchers. Researchers checked all questionnaires for completeness and accuracy. All data collection was monitored by both researchers who monitor survey process at frequent intervals.

2.11 Data Management and Analysis

2.11.1 Data management

Data collection were completed using (Electronic devices, and sometimes face to face) Data from questionnaires were transferred into a/an (Database software Dr. Omid Saber (e.g., Excel, Access, EpiInfo)) database. Data were cleaned and analyzed using (Statistical software name).

2.11.2 Data Analysis

Data were analyzed descriptively to assess and knowledge, attitudes, and practices regarding to protection from COVID 19, and history of infection by this virus with its all types of complications (Physical and Biological).

2.11.3 Limitations

This evaluation was subject to the limitations of cross-sectional surveys, including sampling, response, and recall biases. In the case it is not possible to get information about complications of COVID 19 with persons who is affected before we will contact with Health and safety units at each college at HMU to obtained the data about infected persons which includes personal information and how we contact with them.

3. Results

In this research 122 individuals included with history of COVID-19 infection all belongs to Hawler Medical University from April 2021- June 2021 and as shown in table (1) that the highest percentage of patients was in the age group (19-29) years which represents about 24.6% with no significant differences P value 0.2.

Tables 1: distribution of COVID-19 according to the age

Age group (years)	Frequency	Percentage	P value
19-29	31	24.6	0.2
30-39	27	22.2	
40-49	25	20.8	
50-59	25	20.7	
60-70	14	11.7	
Total	122	100	

Table (2) demonstrated that the highest percentage of COVID-19 infection was among the students which was 61(50%) and also higher in females than males 77(63.1%) and the highest percentage of patients get infected by contact with family 69(56,6%)

Table 2: some sociodemographic factors associated with COVID-19 infection

		No.	%	
Position	Academicstaff	49	40.20%	0.008
	Employer	12	9.80%	
	Student	61	50.00%	
Gender	F	77	63.10%	0,06
	M	45	36.90%	
Residency	Center	103	84.40%	0.0
	surrounding	19	15.60%	
How youget COVID 19 infection	Family	69	56.60%	0.0
	from friend	21	17.20%	
	From the environment	1	0.80%	
	From the	1	0.80%	

	workingplace			
	From Uncle	1	0.80%	
	Hospital	5	4.10%	
	I don't know	12	9.80%	
	Working time	1	0.80%	
	Maybe fromthe patients	1	0.80%	
	My Colleague	1	0.80%	
	From community	1	0.80%	
	Patients	2	1.60%	
	Sign and symptoms	1	0.80%	
	celebration	1	0.80%	
	May be from students	1	0.80%	
	From college	1		
	From work	1	0.80%	
	Examinationhall	1	0.80%	

Table 3: revealed that the highest percentage of patients have been treated in the home 85(69.7%)

Table 3: methods of treatment of COVID -19

Where you received treatment?	clinic	13	10.70	0.8
	Home	85	69.70	
	Hospital	3	2.50	
	No treatment	21	17.20	

Table 4: revealed that the highest percentage of patients had symptoms 113(92.6%)

Table 4: types of clinical presentation among patients with COVID-19 infection

Did the person have symptoms?	No	5	4.10	0.08
	Unknown	4	3.30	
	Yes	113	92.60	

The highest percentage of patients were non- smoker 113(92.6%)

Table 5: incidence of smoking among patients with COVID-19 infection

Are you smoker?	No	113	92.60	0.02
	Yes	9	7.40	

Table (6) demonstrated that the highest percentage of COVID-19 were in the patients with blood group A+ which was 39(32%)and the lower percentage of infection were in patients with AB- blood group which was 2(1.6%)

Table 6: Frequency distribution of the ABO blood group in this study (count and percentage)

Blood group	A-	3	2.50	0.6
	A+	39	32.00	
	AB-	2	1.60	
	AB+	8	6.60	
	B-	3	2.50	
	B+	26	21.30	
	O-	59	4.10	
	O+	36	29.50	

Table (7) revealed that the highest percentage of patients represented with myalgia 109(89.3%) and head ache 106 (86.90%) followed by fever 104(85.2%), fatigue 99(81.1%), cough 74(60.7%)j and the lowest percentage of presentation was conjunctivitis which was 19(15.6%)

Table 7: clinical characteristics of the patients with COVID-19 infection

		No.	%	P-Value
Fever	No	18	14.80 %	0.000 HS
	Yes	104	85.20 %	
Cough	No	48	39.30 %	0.019 S
	Yes	74	60.70 %	
Shortness of breath	No	75	61.50 %	0.011 S
	Yes	47	38.50 %	
Sore throat	No	56	45.90 %	0.365 NS
	Yes	66	54.10 %	
New loss of taste or smell	No	43	35.20 %	0.001 HS
	Yes	79	64.80 %	
Chills	No	50	41.00 %	0.046 S
	Yes	72	59.00 %	
muscle aches	No	13	10.70 %	0.000 HS
	Yes	109	89.30 %	
Nausea	No	103	84.40 %	0.000 HS
	Yes	19	15.60 %	
Runny nose	No	78	63.90 %	0.002 HS
	Yes	44	36.10 %	
Headache	No	16	13.10 %	0.000 HS
	Yes	106	86.90 %	
Fatigue	No	23	18.90 %	0.000 HS
	Yes	99	81.10 %	

Table (8) showed that the highest percentage of complication that occurred in patients with COVID-19 infection was fatigue which was 109(104%), depression 80(65.6%), loss of appetite 69(56.6%), loss of weight 62(50.8%)

Table 8: some complication of COVID-19 infection

Acute respiratory syndrome	No	100	82.00 %	0.000 HS
	Yes	22	18.00 %	
Diabetes	No	115	94.30 %	0.000 HS
	Yes	7	5.70 %	
urinary tract infection	No	113	92.60 %	0.000 HS
	Yes	9	7.40 %	
uremia	No	120	98.40 %	0.000 HS
loss of memory	No	94	77.00 %	0.000 HS
	Yes	28	23.00 %	
anemia	No	101	82.80 %	0.000 HS
	Yes	21	17.20 %	
fatigue	No	13	10.70 %	0.000 HS
	Yes	109	89.30 %	
depression	No	42	34.40 %	0.001 HS
	Yes	80	65.60 %	
insomnia	No	62	50.80 %	0.856 NS
	Yes	60	49.20 %	
loss of appetite	No	53	43.40 %	0.147 NS
	Yes	69	56.60 %	
loss of weight	No	60	49.20 %	0.856 NS
	Yes	62	50.80 %	
cardiac disease	No	114	93.40 %	0.000 HS
	Yes	8	6.60 %	
hypothyroidism	No	114	93.40 %	0.000 HS
	Yes	8	6.60 %	
hyperthyroidism	No	114	93.40 %	0.000 HS
	Yes	8	6.60 %	
Cardiac disease	No	119	97.50 %	0.000 HS
	Yes	3	2.50 %	

Table (9) revealed that COVIOD-19 associated with some chronic disease: asthma in 15(12.3%), obesity 22(18%)

Table 9: association of COVID -19 with chronic diseases

Diseases				p- value
Asthma	No	107	87.70 %	0.000 HS
	Yes	15	12.30 %	
Diabetes	No	118	96.70 %	0.000 HS
	Yes	4	3.30 %	
hypertension	No	113	92.60 %	0.000 HS
	Yes	9	7.40 %	
Cancer	No	122	100.00 %	0.000 HS
Liver disease	No	122	100.00 %	
Renal disease	No	116	95.10 %	0.000 HS
	Yes	6	4.90 %	
Immunosuppressed	No	114	93.40 %	0.000 HS
	Yes	8	6.60 %	
Obesity	No	100	82.00 %	0.000 HS
	Yes	22	18.00 %	
On dialysis?	No	122	100.00 %	

4. Discussion and Conclusion

Coronavirus is one of the major viruses which primarily affecting the respiratory system in human. However, Coronaviruses have been also diagnosed in animals and can cause a range of sever diseases such as gastroenteritis and pneumonia (Zhang et al., 2020).

In a study done by (Monod eta) who found that adults aged 20 to 34 and 35 to 49 are the only age groups that have sustained SARS-CoV-2 transmission with reproduction numbers (transmission rates) consistently above one. The high reproduction numbers from adults are linked both to rebounding mobility over the summer and elevated transmission risks per venue visit among adults aged 20 to 49 and the data provide no evidence that transmission shifted to younger age

groups before school reopening, and no evidence that young adults aged 20 to 34 were the primary source of resurgent epidemics since the summer of 2020(Monod et al., 2020).

Our result revealed that COVID 19 infection in female was higher than males and this opposite to many studies done in China (Mo et al., 2020) and New York (Goyal et al., 2020) where they found that the infection was higher in males than females and also a study by (Khan et al.,) demonstrated that

the infections were more frequent among male gender accounting for 85 (70.25 %) patients (Khan et al., 2020) and this differences with our result may be due to geographical variances and according to our life style due to exposed female to social, physical stress which keep her in bad health conditions.

Incubation period for COVID-19 is defined as the interval between the potential earliest date of contact of the transmission source (wildlife or person with suspected or confirmed case) and the potential earliest date of symptom onset (i.e. cough, fever, fatigue or myalgia) and in 14 days following exposure. Median incubation period being 4 days (interquartile range, 2- 7 days; means 50% cases are dispersed during this period) (Sharma et al., 2020).

This survey revealed that the direct contact was the most of the COV ID infection acquired by direct contact (from family) about 56.5% and this approved by many studies which they revealed that direct contact is the most common method to get infection by COVID -19, Airborne transmission via aerosols formation is suspected to be the main mode of transmission Aerosols are particles under 100 µm in diameter (Tellier et al., 2019). Thus, their minute size and suspension in the air may ease direct contraction of the virus. Aerosols may be formed during various surgical and dental procedures or may be formed as droplet nuclei while talking, coughing, and sneezing by an infected patient. In a study by Li et al., eight health care staff and five post -operation al patients tested positive for COVID-19 aft er being in close contact with an infected patient This suggests that droplet format ion serves as a potent mode for human-to-human transmission (Li et al., 2020B).

The outbreak of a family cluster (Chan et al., 2020) and transmission from an asymptomatic patient (Ro the et al., 2020)]. Thus, early detection and timely isolation is vital before a single case becomes a cluster. It also raises the concern that the risks and benefits should be considered in home quarantine for confirmed cases, which could result in family case clusters if they transmit the virus to other

members of the same household during the initial phase of the COVID-19 outbreak,

the diagnosis of the disease was complicated by the diversity in symptoms (Khan et al., 2020).

Confirmed transmission routes include ai r borne and close contact. Fecal-oral route and aerosol transmission could not be excluded. Hospital outbreaks of SARS-CoV-2 infection occurred in the early phase of epidemic when the disease was not recognized and before quarantine measures were implemented and SARS-CoV-2 is highly infectious and is susceptible to all populations. Respiratory droplets and contact transmission are the main transmission routes, and aerosol transmission is also possible (Li et al., 2020 A).

The current survey showed that the highest percentage of infection was in those individual with blood group A (34.5%) and this result is in agreement with many studies done around the world: a study done in Wuhan reported a link between COVID -19 susceptibility and the ABO blood group. Specifically,

people with blood group A have a higher risk whereas people with blood group O have a lower risk for SARS -COVID-2 infection (Li et al., 2020C), and also in study done by (Wu et al., 2020 A) patients with blood group A had an increased risk for infection with SARS- CoV-2, whereas blood gr o up O was associated with a decreased risk, indicating that certain ABO blood group were correlated with SARS-COVID-19 -2 susceptibility (Wu, et al., 2020B)

A study by (Zhang et al.,) suggest s t at blood type O may serve as a protective fact or, as individuals with blood type O are found COVID-19 positive at far low er rat es. This could suggest that blood type 0 individuals are less susceptible to infection, or that they are asymptomatic at high er rates and therefore do not seek out testing (Zhang et al., 2021) (Dai, 2020)

Regarding the symptoms fever was recorded in 85.2%, cough (60.7%), dyspnea (38 .5%), Sore throat (54.1%) loss of taste and smell in (64.8%), chill (59%), myalgia (89.3%), head ache (86.9%), fatigue (81.1%) and to less extend: nausea, runny nose, chest pain, diarrhea, abdominal pain and vomiting.

The 2019-COVID infection caused clusters of severe respiratory illness similar to severe acute respiratory syndrome coronavirus and associated with ICU admission and high mortality (Huang eta, 2020).

In a study done by (Mo et al.,) found that in patients with COVID -19, fever, cough, and myalgia were the most common symptoms, followed by shortness of breath and respiratory distress. However, upper respiratory tract symptoms (eg, nasal congestion, nasal discharge, and sore throat) and gastrointestinal symptoms (eg, abdominal pain and diarrhea) were relatively rare (Mo et al., 2020)

In addition to being new, COVID-19 has often been unpredictable. As common a symptom as fever is, there is no definitive temperature range for this condition. Some people who test positive never run a fever. Others spike very high fevers (Steele et al., 2020)

A later review of studies trusted source involving 17,515 adults and children with COVID-19 uncovered similar results, of all the adult participants, 79.43 percent ran a fever during their illness. Low- and medium-grade fevers were also more likely to occur in this population than high fevers (Islam et al., 2021)

Researchers also noted that fever was less likely to occur in children, especially during the early days when symptoms begin. They found that 45.86 percent of 373 children in China experienced fever. The authors conclude that over 50 percent of children under 18 years old with COVID-19 presented without fever (Mahal et al.,2021)

Despite the lack of a specific temperature range, it is clear that fever can indicate serious illness. The majority of hospitalized COVID-19 patients have fever as a symptom. However, running a high fever does not mean they have a serious outcome (Wu et al., 2020)

A study by (Tharakan et al.,) involving over 7,000 COVID-19 patients in the New York City area found that initial high fever upon hospital admission did not correlate significantly with death (Tharakan et al., 2020).

However, persistent high fevers throughout the course of illness were significantly correlated with death due to COVID-19. People whose fevers spiked to 104° F (40° C) or higher had a mortality rate of 42 percent (Shang et al., 2020).

This same study found that abnormally low body temperatures were associated with the poorest outcomes. Those with a body temperature under 96.8 °F (36 °C) had the highest death rates (Young and Watson, 2006).

These two above (Shang et al., 2020), and (Young and Watson, 2006) studies disagree with our result.

A published study on clinical characteristics of 138 hospitalized patients with COVID-19 in Wuhan, China, documented that fever was present in 98.6% (136/138) of hospitalized patients, whereas 2 non-intensive care unit patients (1.4%) did not present with fever (Bwire and, Paulo, 2020)

Fever in the returning traveler is a common clinical scenario that often leads to hospitalization and may be the only symptom of a serious or life-threatening illness (Thwaites and Day, 2017)

Fever has been observed as one of the most common clinical manifestations, although the prevalence and characteristics of fever in adult and pediatric COVID- 19 patients is inconclusive, although widespread clinical spectrum of SARS-CoV- 2 infection has been observed ranging from asymptomatic, mild upper respiratory

tract illness to severe viral pneumonia with respiratory failure and, death. Although the clinical symptoms of COVID-19 include co ugh, sore throat, muscle ache, shortness of breath, headache. smell dysfunction and taste disorder: fever has been observed as the most predominant initial clinical symptom in both adult and pediatric COVID-19 patients. A variable degree of fever ranging from low to high- grade accompanied with or without chills has been detected in COVID-19 patients (Islam eta l,2021)

Fever is a manifestation of the release of proinflammatory cytokines (interleukin- l a, interleukin- 1, interleukin-4, interleukin-6, and tumor necrosis factor a) from macrophages, lymphocytes, fibroblasts, epithelial cells, and endothelial cells as a consequence of infection or inflammation (Tanaka et al., 2014).

Severe acute respiratory illness with fever and respiratory symptoms, such as cough and shortness of breath, comprise the working case definition used to select people for viral testing. This strategy captures typical symptomatic presentation, but imperfectly identifies unusual manifestations, such as patients without respiratory symptoms or only very mild symptoms. One widely cited modelling study concluded that up to 86% of cases might have been missed in China and reports of patients with unusual presenting symptoms are rising worldwide (Goodman et al., 2020).

Hypertension is the global leading cause of mortality and represents the most important factor predisposing the risk of developing cardiovascular diseases. Hypertensive patients typically have over-elevated ACE/ANGIi axis, in which Angiotensin converter enzyme ACE positively regulates the level of angiotensin II (ANGIi) in the renin- angiotensin- aldosterone system (RAS).

This raises the possibility of faecal-oral transmission, which would have clear implications for infection control (Peiris et al., 2003)

(Giacomelli et al., 2020) and new anosmia is being proposed as a criterion for testing, especially in young people with few other symptoms (Temmel et al.,2020) and this in agreement with our study.

Animal models indicate that coronaviruses might track into the brain via the olfactory nerve or bulb or both, causing neuronal damage or death (Netland et al.,2008)

Recent studies describe other neurological symptoms among patients with COVID-19, including ischemic or hemorrhagic stroke, dizziness, headache, musculoskeletal disturbance, altered mental state, Guillain-Barre syndrome, or

acute necrotizing encephalopathy, without proof of direct viral invasion into the brain (Mao eta l,2020).

The clinical presentations of SARS-CoV-2 are different for various patients, which made its, diagnosis a challenging task for healthcare providers. Fever, dry cough, dyspnea, myalgia, diarrhea, etc. are the most frequent presentations of the SARS-CoV-2(Huang eta, 2020) and this in agreement with our result.

Specific comorbidities associated with increased risk of infection and worse outcomes with development of increased severity of lung injury and mortality have been reported.

The most common comorbidities in one report by (Zhou et al., 2020) were hypertension (30%), diabetes (19%), and coronary heart disease (8%) (Schiffrin et al., 2020) and this agree with our ratio of hypertension was about twice the ratio of diabetes, in this study, the most frequent comorbidities in patients with COVID-19 who developed the acute respiratory distress syndrome were hypertension (18%), diabetes (5.70 %), and cardiovascular disease (6.60 %)

Case series report gastrointestinal symptoms in 2-40% of patients (Alhazzani et al., 2019) and diarrhea can be the initial manifestation of infection (Song eta l,2020). Whether SARS-CoV-2 leads to such symptoms directly by infecting the gastrointestinal tract, indirectly by neurological involvement, or through production of cytokines remains unknown. Viral RNA has been detected in stool samples, sometimes at high levels (Wölfel et al., 2020) and in our study the % of diarrhea was (30-30%) and Abdominal pain was 33.60%.

5. Recommendations

1. Fever is a signal of COVID-19 that may become threat to life and then led to death, the temperature above 410C can causes death to patient with COVID
2. 19. Fever with VOVID 19 is considered the main cause echoes of symptoms such as fatigue of mind and body, appearance of appetite, back and bottom, internal discomfort, cues and actions such as high temperature, tremors, loss of consciousness and delirium.
3. Reduced renal function is associated with rised heart beats, hypertension, and significantly increased risk for Cardiac disease. In patients with COVID 19, raised heart beat is associated with increased risk for Cardiac disease. Hypertension in patients with COVID 19, is as a result of the blood pressure is abnormally high, and it occurs when the arterioles narrow, led to the blood to exert excessive pressure against the blood vessel walls and forcing the heart to work more and more to keep the pressure and the heart be weakened to the point of failure.
4. COVID 19 was high level in young age group because they are not following instructions of COVID 19 scientific committee/Ministry of Health MOH in Kurdistan region and they need more awareness about the complications of this infection disease at HMU.
5. COVID 19 was high level in female gender and this may be due to some factors like life style (unhealthy food, no sport, no social life) and this will lead to body effect in immune system and that why the percentage % of infections high level in female therefore we need to change the women life style in our society via cooperation between health, culture, higher education and educational ministries.
6. The infection in center higher than surrounding so its mandatory to decrease the percentage % of infection in the future and the campus of universities should be outside of city
7. According to this study results the transmission of COVID 19 was among some family was higher than other factors so any individual infected should be completely isolated from other members of family.

6. Dissemination of Findings

Aggregated results were reported to key stakeholders, such as the Ministry of Health, the COVID 19 Coordination Committee in HMU, Data access and reporting policies will be followed. Additionally, results may be presented at appropriate scientific conferences or published in scientific or public health literature.

7. Ethical Considerations

7.1 Potential risks/discomforts

The potential risk of a loss of confidentiality was minimized by the use of survey identification numbers and removal of personal identifiers at the time of data entry. There are no anticipated risks or discomforts. The evaluation activities impart no greater than minimal risk to participants, i.e., the risks encountered to the participants will be no greater than those ordinarily encountered in daily life.

7.2 Potential benefits

Findings from this evaluation will provide information for guiding social mobilization activities for the complications of COVID 19 and provide information for implementation of a comprehensive COVID 19 prevention and control plan in (HMU), which may positively impact the health of the population.

7.3 Timeline

Evaluation implementation activities were carried out over two months. The initial survey take place in [April 2021]. Data entry and analysis will occur throughout the period of fieldwork. Dissemination of survey findings will occur following completion of data analysis and report writing.

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Appendix 1

Employee Covid-19 Screening Questionnaire

The safety of our employees is our overriding priority. As the coronavirus (COVID-19) pandemic continues, we are monitoring the situation closely and following the guidance from the Centers for Disease Control and Prevention and local health authorities. In order to prevent the spread of the coronavirus and reduce the potential risk of exposure to our workforce, we are asking everyone to complete and submit this questionnaire prior to entering the worksite. Please do not enter the worksite until your responses have been reviewed and your entry has been approved.

Please respond to each of the following questions truthfully and to the best of your ability. Your participation is important to help us take precautionary measures to protect you and our other employees.

Name:	
Phone Number (mobile/home):	
Position:	student
	Academic staff
	Employer
	Visitor
Gender:	Female
	Male
Residency:	Center
	surrounding
Did you infect or not:	No (if No leave the survey)
	Yes (if yes you can participate in this survey)
How you get COVID 19infection	from friend
	Family
	other
Date of specimen collection :	_ _DD / _ MM_ / YYYY_ _ (from NCIMS if available)

Where you received treatment:	Hospital
	Home
	clinic
	No treatment
Did the person have symptoms?	Yes. If Yes, onset date: _ DD_ / _ _MM / _ YYYY_ _ _ (dd/mm/yyyy)
	No
	Unknown
Are you smoker?	Yes
	No
History of pregnancy	Yes
	No
Group blood	A+
	A-
	B+
	B-
	O+
	O-

Representations

Are you have any of the following symptoms?

Yes ☐ No ☐	Fever
Yes ☐ No ☐	Cough
Yes ☐ No ☐	Shortness of breath or difficultybreathing
Yes ☐ No ☐	Sore throat
Yes ☐ No ☐	New loss of taste or smell

Yes ☐ No ☐	Chills
Yes ☐ No ☐	muscle aches
Yes ☐ No ☐	Nausea
Yes ☐ No ☐	Runny nose
Yes ☐ No ☐	Headache
Yes ☐ No ☐	Fatigue
Yes ☐ No ☐	Chest pain
Yes ☐ No ☐	Diarrhea
Yes ☐ No ☐	Abdominal pain
Yes ☐ No ☐	Joint pain
Yes ☐ No ☐	Conjunctivitis
Yes ☐ No ☐	vomiting

Did you have any of the following complications

Yes ☐ No ☐	Acute respiratory syndrome
Yes ☐ No ☐	Diabetes
Yes ☐ No ☐	loss of taste and smell
Yes ☐ No ☐	urinary tract infection
Yes ☐ No ☐	uremia
Yes ☐ No ☐	loss of memory
Yes ☐ No ☐	anemia
Yes ☐ No ☐	fatigue
Yes ☐ No ☐	depression
Yes ☐ No ☐	insomnia

Yes ☐ No ☐	
Yes ☐ No ☐	loss of appetite
Yes ☐ No ☐	loss of weight
Yes ☐ No ☐	cardiac disease
Yes ☐ No ☐	hypothyroidism
Yes ☐ No ☐	hyperthyroidism

Did you have any health problems before your COVID-19 illness?

Yes ☐ No ☐	Cardiac disease
Yes ☐ No ☐	Asthma
Yes ☐ No ☐	Diabetes
Yes ☐ No ☐	Cancer
Yes ☐ No ☐	Liver disease
Yes ☐ No ☐	Renal disease
Yes ☐ No ☐	Immunosuppressed
Yes ☐ No ☐	Obesity
Yes ☐ No ☐	On dialysis?