Hindawi
Health & Social Care in the Community
Volume 2023, Article ID 5329930, 10 pages
https://doi.org/10.1155/2023/5329930

Research Article

The Knowledge and Perception about COVID-19 among Medical Imaging Professionals

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Received 27 August 2022; Revised 3 October 2022; Accepted 26 October 2022; Published 9 February 2023

Academic Editor: Ayush Dogra

The coronavirus invaded the world in late 2019. It includes many subtypes, majorly severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). Jordan has faced enormous hardships in dealing with the abrupt spread of the coronavirus disease of 2019 (COVID-19) pandemic. Jordan has taken severe and deterring measures to combat the disease's spread, such as closing Jordanian schools and institutions. Medical imaging professionals (MIPs) play a vital role in corona patients' diagnosis, management, and treatment planning, and their awareness is essential to understand. This study focuses on medical imaging professionals (MIPs) and their aid in COVID-19 planning. The knowledge and perception of the COVID-19 pandemic were assessed using a live cross-sectional survey conducted during the outbreak. Medical imaging professionals and trainees in private, military, and government hospitals provided data. Regarding the diagnosis of COVID-19, the researchers have found that molecular biology techniques are the first line of defence, whereas nasopharyngeal swabs and the polymerase chain reaction (RT-PCR) are also prevalent among medical professionals for COVID-19 testing. Overall, medical imaging experts and interns in Jordan exhibited expected levels of knowledge and perception. They advised following the CDC and WHO guidelines in their healthcare settings to offer an acceptable approach during the pandemic.

1. Introduction

In China in December 2019, doctors identified the first case of a respiratory illness caused by the coronavirus disease of 2019 (COVID-19) [1]. It has a large viral family tree with viruses including severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and COVID-19, all of which belong to the coronavirus genus [2]. The World Health Organization (WHO) called this virus-prompted illness COVID-19 and reacted quickly. On January 30, 2020,

it became a pandemic and required worldwide joint efforts [3]. Jordan confronted a sizable project with significant and quick unfolding of this unknown new epidemic and incorporated stringent guidelines to confront the ailment. As a result, Jordanian faculties and universities were closed, and access to the clinic was limited to active patients with intense medical diseases. Until August 2020, 1869 cases were reported in Jordan.

Most COVID-19-affected individuals report fever, dry cough, weakness, nausea, and myalgia, as well as a loss of the ability to smell or taste [4]. However, infection with the coronavirus has been associated with acute hearing loss, and researchers are currently determining the causes [5, 6]. The medical situation regarding COVID-19 is complicated, with severe instances resulting in severe pneumonia, acute breathing misery syndrome, organ failure, and even death [3].

COVID-19 individuals continue to have hypertension, diabetes, cardiovascular disease, cerebrovascular disease, chronic obstructive pulmonary disease (COPD), malignancies, chronic renal disease, and smoking, which are connected to minimal survival and greater mortality rates. Extreme bronchial allergies are also hospitalisation risks. Due to comorbidity, death rates have risen with the age factor. Similarly, child mortality rates rise slightly. However, male mortality rates are greater due to smoking [5, 6].

The disease contaminates through coughing and sneezing droplets from symptomatic and asymptomatic patients, which stay on body surfaces for days until eliminated via antiseptics containing hydrogen peroxide, sodium hypo-chloride, etc. [4]. The incubation stages of coronavirus differ on all surfaces, with 2–14 days on the skin, 3 hours on plastic, and 72 hours on stainless steel; with varying median common $t_1/2$ (approximately 1.1 to 1.2 hours in aerosols, 5.6 hours on stainless steel, and 6 to 8 hours on plastic) that complicate disinfection methods. Human transmissions were seen within family circles and among colleagues [3]. As the spread of the disease is through physical touch with other contaminated humans and surfaces; therefore, social distancing is the ultimate shield.

Medical imaging professionals (MIPs) play a pivotal role in decision-making and performing vital tests on COVID patients. They can be beneficial for differential prognosis of COVID-19 and following up the development of further symptomatic viral respiration diseases [5, 6]. Adherence to control measures via healthcare vendors of MIPs is essential. It is motivated by their know-how and experience, attitudes, and perceptions in the direction of COVID-19 because photograph prognosis is the second degree for COVID-19 verification after a blood test [3, 4].

The researchers located that the first-line technique for diagnosing COVID-19 is molecular biology techniques. The accountable employees use nasopharyngeal swabs with a polymerase chain reaction (RT-PCR) because of their maximum accuracy [7]. Chest radiography (CXR) is the complete imaging technique which is used when there are suspected instances of COVID-19 contamination. Portable radiographs are generally used to prevent transmission of the disease as transportation might increase the chance of contact [5, 6]. Chest CT is the most accurate for early detection even for asymptomatic patients [8]. The use of computed tomography (C.T) modality in diagnosing the asymptomatic suggests unusual ground-glass capacities that might be prevalent COVID-19 imaging symptoms. After CT analysis and repeating molecular checks some days later, it becomes generally visible that the outcomes of the molecular reviews have been positive. Ultrasound can also diagnose youngsters and pregnant women and can be saved through ionizing radiation therapy. However, its diagnostic characteristic stays to be determined [5, 6].

Optimal protocols for coping with infections should be finished beneath the radiology departments to lower the feasible dangers of transmitting the ailment to medical imaging professionals (MIPs) and other healthcare employees. Qu [3] advises using synthetic intelligence to optimize contamination prevention while computed tomography (CT) scanning. This machine permits radiographers to train the patient and manipulate the computed tomography (CT) scanner without leaving the room. These investigations demonstrated that equipping computed tomography (CT) scanners with an artificial intelligence, and automatic scanning will appreciably lowers the chance of contagion among radiographers. In addition, all healthcare employees in the cleansing system and exam rooms should be educated about decontamination techniques, and departmental radiology managers should scrutinize contamination-control tactics to enhance protection [6].

The function of scientific imaging inside the COVID-19 pandemic is crucial. As front-line workers, medical imaging professionals (MIPs) need to know about problems with imaging COVID-19 patients so they can continue to protect patient safety, care for patients who are upset, and improve imaging quality as a tool for better, more accurate diagnosis. Most importantly, MIPs have to be aware of tactics to stay wholesome at some point of the COVID-19 pandemic while efficiently using the valuable resource of a nonpublic protecting system (PPE). It ensures that each one of their workstations is properly decontaminated to reduce further dangers [6]. During the COVID-19 outbreak in India, Kotian et al. [4] discovered that MIPs have minimal knowledge of the disease management and no reasonable practices were conducted. On the contrary, the scientific experts had well know-how regarding the indication and symptoms of the coronavirus. The authors in [9] conducted a questionnaire-based survey taken from two groups including general public and health care professionals from India about COVID-19 symptoms, and most of the participants reported that breathing difficulty is the main symptom for taking medical help. In Jordan, the control facilitates and emergency requirements were well controlled during COVID-19 times. This study investigates the perceptions among MIPs regarding the coronavirus pandemic.

Radiology modalities have been known to aid the medical field in various ways, and it has been exceptionally helpful in the recent COVID-19 pandemic that hit the world by a storm. A pneumonia outbreak of unknown origin was reported in Wuhan, Hubei Province, China, in December 2019. This outbreak, also known as severe acute respiratory

syndrome coronavirus-2 (SARS-CoV-2), has resulted in a serious worldwide pandemic with significant public health concerns. It has undergone several mutations that will drive viral evolution, have an impact on the virus's transmissibility and pathogenicity, as well as the immune escape and development of therapeutic resistance.

In March 2020, the World Health Organization (WHO) declared an "epidemic outbreak" of this contagious respiratory illness. The family Coronaviridae, subfamily Orthocoronavirinae, and genus Beta coronavirus all contain the SARS-CoV-2 virus. An enveloped virus called SARS-CoV-2 has a single-stranded positive-sense RNA genome of 29,903 nucleotides and 11 open reading frames (ORFs) that encode 29 proteins. In collaboration with numerous governmental organizations, more than 80 businesses and research institutions from around the world are working to create an efficient vaccine. Six licensed vaccinations have so far been registered. There are currently no licensed medications for COVID-19, and pharmaceutical researchers are rushing from development to clinical trials to identify new medications [10].

During this pandemic, radiology modalities played an essential role in the surveillance of cases, development, treatment, and diagnosis of (SARS-CoV-2). Common imaging methods include computed tomography and chest radiography. Rapid and precise disease identification is required for coronavirus disease 2019 (COVID-19) testing. Akudjedu et al. [11] presented a comprehensive review methodology for the global focus of the COVID-19 pandemic on clinical radiography. The methodology was based on data from primary studies that used qualitative, quantitative, and mixed approach design concepts from a variety of databases (Scopus/PubMed). The authors also proposed some suggestions for future services. This has demonstrated the value of medical imaging. Since pneumonia characterized the majority of COVID-19 patients, medical imaging became essential for making an early diagnosis and gauging the severity of the disease. In addition, the SARS epidemic served as an example of how medical imaging plays a key role in infectious illness outbreaks [12]. Some of the researchers [13] discussed the significance of using artificial intelligence in the medical field, in general, and in medical imaging and radiology operations in particular, in order to combat the COVID-19 pandemic. Future prospects of COVID-19 are focused mostly on scientific investigations, such as questionnaire surveys [14], medical imaging techniques, and nanotechnology components [15].

The remaining portion of the script is organised as follows: Section 2 implicates the materials and methodology followed in this work. Sections 3 and 4 describe the experimented results and relative discussion of the main motive of the work. Section 5 reflects the conclusion of the script.

2. Materials and Methods

A live cross-sectional survey was conducted inside the Jordan hospitals. At some point, the fast unfolding of COVID-19 changed into an assessment and improved the primary records of the approximate virus. These data are accumulated from medical imaging professionals (MIPs) in private, military, and authorities' hospitals. Data were also collected from 4th year clinical imaging students via a Google-generated form. The study's method changed into defined contributors and looked at the reason connected to the questionnaire. A consent statement was added to the questionnaire for each participant, and anonymous data were conducted.

The questionnaire utilised in this script includes three parts. The first part contained demographic variables of the contributor, namely, gender, age, instructional level, workplace, and job which are shown in Table 1. The 2nd part included 20 questions proposed to estimate the basic knowledge of medical imaging professionals (MIPs) regarding COVID-19. The questionnaire was supposed to evaluate record sources, education revel in with COVID-19, prognosis, control of COVID-19 patients, use of PPE, protection protections, quarantine procedure, and contamination prevention steps. The listing of questions and solutions are reported in Table 2. In the 0.33 part of the questionnaire, a few questions were designed to clarify every participant's revel in the COVID-19 virus and their readiness to address COVID-19 patients. Details are proven in Table 3.

The questions' nature changed to closed, and all questions allowed for both agree-disagree options. To decide the knowledge of a given participant, for the appropriate and wrong solution, the marking changed into one and 0, respectively. Data series accumulated. The questionnaire transformation was performed with inside the English language. In the experimental look, 30 individuals tested the anonymous questionnaire. These realistic looks at these individuals are no longer carried out within the very last evaluation, and this look is accredited using the Institutional Review Board (IRB) in Jordan. Frequencies and possibilities had been used to explain records. The chi-rectangular looks at changes were carried out to decide if there had been any institutions among demographic variables and the questions. The clinical imaging students' degrees of know-how and mindset were compared with clinical imaging workers' solutions to reveal which organization became more informed and aware. The statistical evaluation was finished with statistical software (IBM SPSS v25 for windows; IBM Corp, Armonk, NY).

3. Results

Three hundred eight contributors finished the questionnaire. The wide variety of medical imaging professionals (MIPs) who finished their research changed into 182. The other 126 contributors have been trainee radiography students. The ratio of male to woman contributors changed from 49.40% people to 50.60% women. Most of the contributors had a bachelor's diploma (73.10%), accompanied by a diploma (24.00%) and a master's diploma (2.90%), and no player had a doctoral diploma in scientific imaging. Participants have been grouped in line with their age, with the 20–29 age institution being the most enormous wide variety of contributors with 72.40%.

Table 1: Demographic information of the study participant.

Characteristics		No. of participants (%)
Gender	Male	152 (49.4)
	Female	156 (50.6)
Age groups	20–29	223 (72.4)
	30–39	66 (21.4)
	40–49	13 (4.2)
	More than 50	6 (1.9)
Educational level	Diploma	74 (24.0)
	B.A.	225 (73.1)
	M.S.	9 (2.9)
	Ph.D	—
Workplace	Private hospitals	62 (20.1)
	Military hospitals	110 (35.7)
	Government hospitals	136 (44.2)
Job	Radiographer	182 (59.1)
	Intern student	126 (40.9)

Table 2: Responses from participants about their knowledge of COVID-19.

Q.No	Questions	YES (%)	No (%)
1	The main clinical symptoms of COVID-19 are fever, tiredness, and dry cough.	299 (97.1)	9 (2.9)
2	COVID-19 can be transmitted through small droplets from the nose or mouth of an infected person, but it cannot spread through airborne transmission.	185 (60.1)	123 (39.9)
3	The best distance between people to avoid infection is 3 to 6 feet.	254 (82.5)	54 (17.5)
4	COVID-19 symptoms appear within 2–14 days.	273 (88.6)	35 (11.4)
5	It is possible for a COVID-19 positive person to show no symptoms.	287 (93.2)	21 (6.8)
6	The person with COVID-19 cannot transmit the virus to others if he has no symptoms of COVID-19.	83 (26.9)	225 (73.1)
7	Not all persons with COVID-19 will develop a severe case.	230 (74.7)	78 (25.3)
8	Old people only can be infected with COVID-19.	28 (9.1))	280 (90.9
9	Children and young adults do not need to take measures to prevent the infection by the COVID-19 virus.	28 (9.1)	280 (90.9)
10	There are more deaths in men than women.	83 (26.9)	225 (73.1)
11	Conventional X-ray is a reliable method of diagnosis for suspected COVID-19 patients.	86 (27.9)	222 (72.1)
12	CT is a reliable method of diagnosis for suspected COVID-19 patients.	213 (69.2)	95 (30.8)
13	Portable X-ray is the preferred modality in order to screen and follow up a patient with COVID-19.	154 (50.0)	154 (50.0)
14	Portable imaging equipment limits the transportation of infected patients and limits infection.	184 (59.7)	124 (40.3)
15	Ultrasound is preferred to be used to screen children and pregnant women.	161 (52.3)	147 (47.7)
16	Hand-washing technique is 7 steps to wash your hand properly.	255 (82.8)	53 (17.2)
17	Your department use “one clean, one in contact with patient” system to image the patient with COVID-19.	176 (57.1)	132 (42.9)
18	The radiographic suite may need to be completely avoided 1 hour after scanning a suspected COVID-19 patient to disinfect the region and air exchange.	196 (63.6)	112 (36.4)
19	The lead apron should be worn before wearing the personal protective equipment.	212 (68.8)	96 (31.2)
20	Artificial intelligence is a suitable solution to reduce infection transmission.	169 (54.9)	139 (45.1)

Table 3: Responses from participants about COVID-19 experience.

Q. No	Questions	YES (%)	NO (%)
1	You were subjected to RT-PCR swab.	83 (26.9)	255 (73.1)
2	Have you undergone the training for the safe use of PPE and manage the COVID-19 outbreak?	111 (36.0)	197 (64.0)
3	Did any technician in your department get or suspect COVID-19?	75 (24.4)	233 (75.6)
4	Do you have confidence in handling and managing a patient with COVID-19?	194 (63.0)	114 (37.0)
5	I previously had a radiograph of a patient infected with COVID-19.	122 (39.6)	186 (60.4)

In contrast, the institution of contributors more than fifty changed into the bottom wide variety with 1.90%. Participants' places of work have been authorities' hospitals, 44.20%; navy hospitals, 35.70%; personal radiology departments, 20.10%. The demographic facts are proven in Table 1.

The results of questions relating to participant knowledge of COVID-19 are provided in Table 2. Nearly all of the individuals agreed that fever, exhaustion, and dry cough are regular signs of COVID-19. 60.10% of the individuals shared a piece of information that COVID-19 might unfold through the inflamed individual's nostril or mouth through tiny droplets; however, it cannot develop through airborne transmission, and thus, this is emitted from the mouth or nostril when, for example, an inflamed individual sneezes, talks, or sings [16]. A small percent of the individuals disagreed that a reasonable social distance had to keep away from contamination. 11.40% of individuals disagreed with the coronavirus incubation period and that COVID-19 symptoms appear within 2–14 days. 93.20% accept that there are coronavirus-inflamed sufferers who now no longer show off signs. The query changed into requested if humans should transmit the coronavirus if they had no signs. 26.9% mistakenly determined that if someone with COVID-19 has no symptoms and symptoms of COVID-19, the individual could not infect others with the virus. 74.70% stated that now no longer all people with COVID-19 might increase in extreme cases. 9.10% of kids and adults are at risk of coronavirus contamination, and now no more essential precautions for prevention are required. 73.10%, in keeping with cent, wrongly claimed to disagree that COVID-19 kills more guys than women.

Multiple participants requested the most reliable traditional X-ray technique for diagnosing suspected coronavirus cases. 27.90% of participants agreed with the traditional X-ray technique, while 69.20% of the individuals agreed with the use of the computed tomography (C.T) scan. 52.30% of individuals agreed that the usage of ultrasound changed enough to diagnose kids and pregnant women.

In contributors' perspectives on using transportable X-rays as a preferred modality to display screen and follow-up of an affected person, contributors had been split, with half of the contributors accepting that transportable X-rays had been a powerful manner of monitoring inflamed sufferers. 59.70% of contributors claimed that transportable X-rays save you from infection and from the unfolding of sickness among sufferers and radiographers. The percentage of contributors who knew that the suitable hand washing method is a seven-step system is 82.80%. Only 57.10% knew the "one clean, one in touch with the affected person"

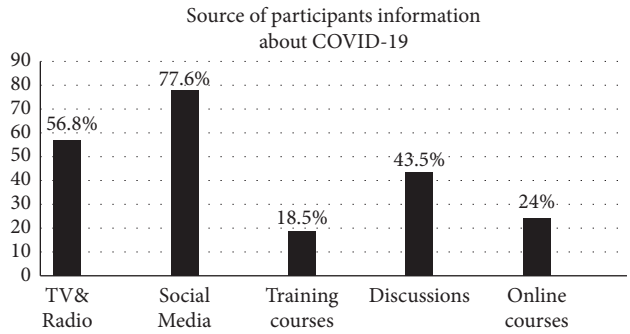

Figure 1: Percentages of various sources of participants' COVID-19 information.

system. 36.40% of the contributors now no longer agree that the radiographic suites would want to be averted 1 hour after scanning a suspected COVID-19 affected person for disinfection and air exchange. According to a cent of contributors, the sporting of the lead apron earlier than the PPE becomes hostile through 31.20%. 54.90% accepted the usage of synthetic intelligence to save you from an infection.

In this work, the responses are recorded from the participants who experienced COVID-19 infection. Complete information was furnished in Table 3. 26.9% of contributors underwent an RT-PCR swab. Only 36.0% of contributors have acquired schooling to apply private defensive devices safely. 24.4% of the contributors had colleagues inflamed with or suspected of getting the COVID-19 virus. When requested approximately about their self-belief to address and control COVID-19 sufferers, 37.0% now no longer have that degree of self-belief, and 39.6% of contributors had imaged of a suspected or inflamed person, according to the number of contributors.

As shown in Figure 1, the sources of participants' information about COVID-19 are varied. Most participants receive their information from social networks, followed by T.V. and radio screens, with the lowest percentage getting their information from training courses.

The majority of radiology societies still do not support systematic CT screening for COVID-19 pneumonia during this pandemic, despite the widespread usage of CT scans in China as a screening tool. The WHO fast advising guide on the use of chest imaging in COVID-19 highlighted factors to be considered when choosing imaging modalities, although it refrained from prescribing particular imaging modalities for certain patient groups. This might be explained by the various societal standards and public health guidelines. Contrary to chest radiography and RT-PCR, a CT scan has a significantly better sensitivity despite having a relatively low

specificity, and this is beneficial for individuals with certain lung disorders who have them already, as well as when RT-PCR test results come back negative. Medical imaging professionals' (MIPs) inadequate knowledge of the condition might hasten the transmission of infection. The purpose of the study was to ascertain MIPs' knowledge and comprehension of COVID-19. At this crucial time, it is vital to comprehend that medical imaging professionals (MIPs) are aware of COVID-19. The ongoing struggle against COVID-19 continues to be of great concern. Because imaging diagnosis is the second step for COVID-19 confirmation after a blood test, adherence to these control measures by medical imaging healthcare providers is crucial to ensure final success. This is greatly influenced by their knowledge, attitudes, and practices (KAP) towards COVID-19 in accordance with KAP theory. The authors of this study focus on medical imaging professionals (MIPs) and their aid in COVID-19 planning. The knowledge and perception of the COVID-19 pandemic were assessed using a live cross-sectional survey conducted during the outbreak. MIPs and trainees in private, military, and government hospitals provided data. Regarding the diagnosis of COVID-19, researchers have found that molecular biology techniques are the first line of defense, whereas nasopharyngeal swabs and the polymerase chain reaction (RT-PCR) are also prevalent among medical professionals for COVID-19 testing. The authors concluded that medical imaging experts and interns in Jordan exhibited expected levels of knowledge and perception. They advised following the CDC and WHO guidelines in their healthcare settings to offer an acceptable approach during the pandemic.

In analyzing the results using the chi-square test, there is a significant difference in some questions between medical imaging professionals (MIPs) and students, as shown in Table 4. MIPs have more interaction with COVID-19 patients than students, so it is expected that the MIPs' results would be better.

Table 4: Comparison between radiographers and students' knowledge of COVID-19.

Q. No	Radiographer(s)		Student(s)		Chi-square
	Yes (%)	No (%)	Yes (%)	No (%)	
1	179 (98.4)	3 (1.6)	120 (95.2)	6 (4.8)	0.167
2	106 (58.2)	76 (41.8)	79 (62.7)	47 (37.3)	0.478
3	151 (83.0)	31 (17.0)	103 (81.7)	23 (18.3)	0.879
4	164 (90.1)	18 (9.9)	109 986.5)	17 (13.5)	0.364
5	174 (95.6)	8 (4.4)	113 (89.7)	13 (10.3)	0.064
6	43 (23.6)	139 (76.4)	40 (31.7)	86 (68.3)	0.119
7	142 (78.0)	40 (22.0)	88 (69.8)	38 (30.2)	0.111
8	14 (7.7)	168 (92.3)	14 (11.1)	112 (88.9)	0.320
9	12 (6.6)	170 (93.4)	16 (12.7)	110 (87.3)	0.073
10	56 (30.8)	126 (69.2)	27 (21.4)	99 (78.6)	0.089
11	50 (27.5)	132 (72.5)	36 (28.6)	90 (71.4)	0.897
12	138 (75.8)	44 (24.2)	75 (59.5)	51 (40.5)	0.003*
13	91 (50.0)	91 (50.0)	63 (50.0)	63 (50.0)	1.000
14	123 (67.6)	59 (32.4)	61 (48.4)	65 (61.6)	0.001*
15	83 (45.6)	99 (54.4)	78 (61.9)	48 (38.1)	0.005*
16	148 (81.3)	34 (18.7)	107 (84.9)	19 (15.1)	0.446
17	117 (64.3)	65 (35.7)	59 (46.8)	67 (53.2)	0.003*
18	113 (62.1)	69 (37.9)	83 (65.9)	43 (34.1)	0.548
19	134 (73.6)	48 (26.4)	78 (61.9)	48 (38.1)	0.034*
20	105 (57.7)	77 (42.3)	64 (50.8)	62 (49.2)	0.246

4. Discussion

COVID-19 is a focal point of world dialogue and debate within the media and the public. The latest spike of COVID-19 instances and transmissions has precipitated tensions to growth for each person, including fitness authorities. Recent research has proven that epidemics contribute to new or deteriorating signs, including anxiety, panic assaults, and depression [17]. Questions have been raised about how rising COVID-19 statistics can help medical imaging professionals (MIPs) in the fitness crisis. For this reason, for the duration of the COVID-19 worldwide outbreak, it became crucial to assess MIP's know-how and belief of COVID-19 and the precautions and management needed.

In clinical articles, we located in clinical reports that COVID-19 transmission happens via breathing droplets that could develop the virus and result in contamination in others. Usually, droplets do now no longer circulate greater than six feet (about meters) and continue to be inside the air. It may be transmitted via airborne routes. However, it is miles arguable as to what diploma this happens in herbal situations and contributes to the pandemic. The distinction is the droplet size to recognize the manner of transmitting. Smaller infectious droplets (those residual debris are called droplet nuclei or aerosols) may be airborne, while large infectious droplets are too heavy to glide in midair [18]. These class structures hire numerous arbitrary droplet diameter cut-offs, from five to ten am, to categorize host-to-host transmission as droplets or aerosol routes [19]. Underneath laboratory situations, researchers observed that the COVID-19 virus remained possible inside the air for 3 hours [19]. Since we do now no longer understand and carefully recognize this virus, taking airborne precautions is a secure idea [20].

Our findings are extensively steady with different estimates for the exceptional social distance and incubation length. Social space is crucial to saving you from infectious sicknesses, including COVID-19 (coronavirus). It has been proposed as one of the exceptional methods to display and keep away from the unfolding of COVID-19. A greater huge extent (82.1%) expressed to live as a minimum of 6 feet (approximately 2 m) from different humans in each indoor and outside environment to exercise social or bodily distancing [21]. According to the findings, the incubation length of COVID-19 is 2–14 days, which is updated based on the 88.6% responses from the contributors. COVID-19 takes five to six days to incubate. However, it may absorb to fourteen days among viral publicity and symptom onset [22]; 93.2% of respondents effectively said that a few inflamed humans have not had any symptoms at all. In California, researchers studied the results of silent transmission for the management of outbreaks of COVID-19. Their findings display that quiet information of the ailment is answerable for greater than 50 according to cent of the general assault charge in attacks of COVID-19 for the duration of the presymptomatic and asymptomatic stages [23].

The researchers' consequences imply that symptomatic patients have minimal differences from asymptomatic ones [24]. According to an investigation performed in Ningbo, China, asymptomatic patients transmitted the virus without difficulty in relation to people with symptoms; this fits our hypothesis. At the same time, 26.9% incorrectly believed there might be no virus transmission to others [24]. Younger age is related to asymptomatic and slight infections, indicating that kids are at similar risk for the pandemic. Testing patients with current or past disease history is the most dependable attribute to evaluate the superiority of asymptomatic instances. 74.7% effectively responded that mild to moderate symptoms were indicated leading to life-threatening outcomes in a short span.

The examination targeted figuring out medical imaging professionals (MIPs) recognition of the COVID-19 virus's effect on one-of-a-kind age groups. 90% of human beings efficaciously disagree with the arguments that COVID-19 can best affect the aged and youngsters and teenagers now no longer want to take precautions to keep away from contamination with the virus. Middle-elderly and older sufferers are more likely to expand complications and be hospitalized, and they die than more youthful sufferers. Chinese and American studies conducted recently predicted that more than 13% of patients who were 80 years of age or older would die from COVID-19 cases, compared to 0.15 percentage points of patients in their 30s and virtually 0% of patients under the age of 20 [25, 26]. The truth that vintage immune structures are much less successful in doing away with viral infections may also partly explain this, and infections of COVID-19 ought to arise in youngsters; however, severe infection is normally avoided. However, all age stages should be vigilant to consider public protection and social distance. With gender in mind, the survey's locating at the query that guys are much more likely to die than girls because of COVID-19 contamination greatly surprised us; guys with COVID-19 are much more likely to have negative consequences and die, no matter age, even as women and men have the equal prevalence [24]. Only 26.9% have the perfect answer, which showed that guys die at a better price than girls. For example, influenza research has proven that older guys seem to have more terrible effects than older girls considering that there are intercourse variations with inside the immune response. Men are more likely to consume alcohol, which weakens their immune system and makes them more susceptible to pneumonia. At least one principal underlying fitness condition, consisting of diabetes, hypertension, obesity, cardiovascular sickness, asthma, kidney sickness, or persistent obstructive pulmonary disorder, is disproportionately in all sufferers which raise the risk of COVID-19 [26–28]. The prognosis of COVID-19 is associated with the invention of viral ribonucleic acid [29] and with the opposite polymerase chain reaction [30, 31], and pulmonary involvement of COVID-19 can also stumble on and is characterized through imaging [32]. The survey indicates that the imaging exercise of COVID-19 differs worldwide, especially concerning using traditional CXR. The survey effects confirmed a big distinction with the inside friendly imaging approach for diagnosing COVID-19 sufferers. As proven with the attached tables, best 27.9% of members indicated that traditional CXR is a secure manner to stumble on the contamination of suspected sufferers. In comparison, 69.2% indicated that computed tomography (CT) is extra reliable. In early/moderate sickness, CXR can be expected. Still, it is easier to obtain than computed tomography (CT), and its miles are regarded as the primary imaging modality for patients suspected of having COVID-19 [33]. Computed tomography (CT) use varies notably; maximum radiology departments do now no longer prescribe regular CT screening to diagnose pneumonia of COVID-19; however, they can achieve this in sufferers beneath investigation. Other studies' findings display that chest computed tomography (CT) in suspected sufferers is touchy; however, now no longer particular to COVID-19 prognosis, indicating that computed tomography (CT) might not be capable for different reasons for respiration sickness COVID-19 contamination. The negative sense of the reference standards (RT-PCR) might also contribute to those negative specificities, as a few times, computed tomography (CT) can be extra touchy than RT-PCR [34, 35]. CXR is used more frequently than computed tomography (CT) in asymptomatic sufferers, representing higher get entry to X-ray equipment. Half of the members desired portable CXR rather than traditional CXR, even as the alternative 1/2 had been towards it, indicating the extent of uncertainty amongst MIPs approximately a way to diagnose the virus. The medical doctor network is predicated on portable CXR because the pandemic progresses; because of its availability and decreased contamination management issues, it is likely to be the number one imaging modality utilised in diagnosing and dealing with sufferers of COVID-19 [36]. The examination clarifies the value of using ultrasound to identify and monitor COVID-19 patients in order to assess how well clinical imaging branch staff are aware that this is achievable. Half of the members agreed; that is magnificent. Lung US may also play a useful function with going inside the diagnostic pathway and early detection of COVID-19 pneumonia [35, 36]. It is an innovative approach for detecting lung consolidation and symptoms of viral pneumonia; U.S.finding out is reportedly robust in shape with chest X-ray and computed tomography (CT) findings [30, 37]. As such, it has miles useful for inspecting the lungs of pregnant girls and youngsters to offer a radiation-loose point-of-care tool [38]. The Italian look cautioned a scientific approach for the overall performance of pulmonary ultrasound tests in pregnant girls. Thus, lung ultrasound can aid in the diagnosis of COVID-19 in resource-constrained settings where chest X-rays, CT, and RT-PCR are unavailable or have a long turnaround time. Radiographers are pronounced as being at an excessive chance of contracting and transmitting pathogens as they have close touch with sufferers and different hosts with those who suspected or showed COVID-19. As such, radiographers ought to comply with the usual protection; this is why, we focus our efforts on figuring out the diploma to which MIPs are privy to prevention and public protection approaches [37]. The effects display that more than 1/2 of the members use and recognize the "one smooth, one in touch with the patient" device. More

than 1/2 of medical imaging professional members indicated with inside the findings that synthetic intelligence ought to lessen MIPs' workload by permitting them to perform behavior tests with specific positioning and automatic scanning without leaving the management room, notably decreasing the chance of infection and accelerating trying out among technicians and sufferers [39]. In indoor areas, coronavirus-encumbered droplets can increase risky levels, specifically for people with negative airflow. Precise airflow should always be maintained within the smooth painting area [8]. After each suspected or inflamed patient, deep cleansing ought to be done, with a downtime of about one hour. At some point during the COVID-19 outbreak, air change charges should be multiplied in unique parts of the radiology branch [38].

The findings suggest that more than seventy-five percent of members depended on social media as a supply of understanding. Social networking has blessings and drawbacks; the prudent use of those structures can assist in hastily distributing new relevant knowledge throughout a pandemic, alternate diagnostic, care, and observe-up protocols, particularly for individuals who continue to be interior due to the pandemic. The downside is the capacity distribution of fake facts and myths. So, it's much better not to add to the information epidemic and instead use the social community to send information in a responsible way. This observation also indicates that how college students are aware of the COVID-19 pandemic and of its rapid increase compared to the medical imaging experts. Medical imaging professionals (MIPs) are extra-certified and in touch with sufferers. That is a variance with college students as they watched the pandemic develop from their houses and stopped education in hospitals. However, there are a few boundaries to this observation. It is an Internet cross-observation performed among MIPs worldwide that recorded troubling cases. The statistics submitted on this observation are self-stated and, in part, primarily based totally on the honesty and capability of the members to remember, which might also consequently make contributions to consider bias. In addition, the COVID-19 pandemic is continuously and hastily emerging, with a constantly evolving epidemiology, regularly affecting the imaging findings and imaging strategies used to categorize the diseases. There will be a lot to learn in the upcoming months, that much is certain. Still, the writers wish that this paper might be the primary technique to be beneficial in summarizing current statistics for the front-line scientific imaging specialists in Jordan.

5. Conclusion

The study observations suggest a basic understanding of medical imaging professionals (MIPs) during COVID-19. The statement determined that more than two-thirds of MIPs have adequate COVID-19 transmission and prevention statistics. There was a confrontation over the high-quality prognosis technique on the radiology department's side. Knowledge is a prerequisite for constructing acceptance as accurate within the prevention, constructing a healthy mindset, and fostering significant behavioral change. In addition, most MIPs recognize the signs and symptoms of COVID-19 and understand the protection methods. MIPs know how vital the self-protection of medical professionals is through social distancing and PPE use. Social media awareness programs are the number one resource for spreading safety measures. Such media campaigns ensure safe practices for all. Overall, scientific imaging specialists and intern college students in Jordan displayed anticipated degrees of knowledge and belief during COVID-19 and were advised to observe the CDC and WHO guidelines for 100% health safety measures.

Data Availability

The data used in this study are not available online as it is private database.

Ethical Approval

This research was approved by Jordan University of Science and Technology ethics on human research committee. The Institutional Research Board (IRB) at Jordan University of Science and Technology has approved the work.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Acknowledgments

The authors express their gratitude to Princess Nourah bint Abdulrahman University Researchers Supporting Project Number PNURSP2022R206, Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia. The work was supported by Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia, Researchers Supporting Project Number PNURSP2022R206.

References

[1] M. R. Geier and D. A. Geier, "Respiratory conditions in coronavirus disease 2019 (COVID-19): important considerations regarding novel treatment strategies to reduce mortality," *Medical Hypotheses*, vol. 140, Article ID 109760, 2020.

[2] A. F. Lombardi, A. M. Afsahi, A. Gupta, and A. Gholamrezanezhad, "Severe acute respiratory syndrome (sars), middle east respiratory syndrome (mers), influenza, and COVID-19, beyond the lungs: a review article," *La Radiologia Medica*, vol. 126, no. 4, pp. 561–569, 2021.

[3] J. Qu, W. Yang, Y. Yang, L. Qin, and F. Yan, "Infection control for ct equipment and radiographers' personal protection during the coronavirus disease (COVID-19) outbreak in China," *American Journal of Roentgenology*, vol. 215, no. 4, pp. 940–944, 2020.

[4] R. P. Kotian, D. Faujdar, S. P. Kotian, and B. D'souza, "Knowledge and understanding among medical imaging professionals in India during the rapid rise of the COVID-19 pandemic," *Health Technology*, vol. 10, no. 6, pp. 1415–1420, 2020.

[5] S. Kooraki, M. Hosseiny, L. Myers, and A. Gholamrezanezhad, "Coronavirus (COVID-19) outbreak: what the department of radiology should know," *Journal of*

the American College of Radiology, vol. 17, no. 4, pp. 447–451, 2020.

[6] N. Stogiannos, D. Fotopoulos, N. Woznitza, and C. Malamateniou, "COVID-19 in the radiology department: what radiographers need to know," *Radiography*, vol. 26, no. 3, pp. 254–263, 2020.

[7] M. Mohamadian, H. Chiti, A. Shoghli, S. Biglari, N. Parsamanesh, and A. Esmaeilzadeh, "COVID-19: virology, biology and novel laboratory diagnosis," *The Journal of Gene Medicine*, vol. 23, no. 2, p. e3303, 2021.

[8] P. An, Y. Ye, M. Chen, Y. Chen, W. Fan, and Y. Wang, "Management strategy of novel coronavirus (COVID-19) pneumonia in the radiology department: a Chinese experience," *Diagnostic and interventional radiology*, vol. 26, no. 3, pp. 200–203, 2020.

[9] P. A. Parikh, B. V. Shah, A. G. Phatak et al., "COVID-19 pandemic: knowledge and perceptions of the public and healthcare professionals," *Cureus*, vol. 12, no. 5, Article ID e8144, 2020.

[10] M. Alhasan and M. Hasaneen, "Digital imaging, technologies and artificial intelligence applications during COVID-19 pandemic," *Computerized Medical Imaging and Graphics*, vol. 91, Article ID 101933, 2021.

[11] T. N. Akudjedu, N. A. Mishio, W. Elshami et al., "The global impact of the COVID-19 pandemic on clinical radiography practice: a systematic literature review and recommendations for future services planning," *Radiography*, vol. 27, no. 4, pp. 1219–1226, 2021.

[12] Y. X. Tay, S. Kothan, S. Kada, S. Cai, and C. W. K. Lai, "Challenges and optimization strategies in medical imaging service delivery during COVID-19," *World Journal of Radiology*, vol. 13, no. 5, pp. 102–121, May 2021.

[13] M. M. Zainal and A. Hamdan, "Artificial intelligence in healthcare and medical imaging: role in fighting the spread of COVID-19," in *Advances in Data Science and Intelligent Data Communication Technologies for COVID-19*, pp. 173–193, Springer, Berlin, Germany, 2022.

[14] A. T. Angelo, D. S. Alemayehu, and A. M. Dachew, "Health care workers intention to accept COVID-19 vaccine and associated factors in southwestern Ethiopia," *PLoS One*, vol. 16, no. 9, Article ID e0257109, 2021.

[15] A. Gupta, S. Kumar, R. Kumar et al., "COVID-19: emergence of infectious diseases, nanotechnology aspects, challenges, and future perspectives," *ChemistrySelect*, vol. 5, no. 25, pp. 7521–7533, 2020.

[16] W. J. Wiersinga, A. Rhodes, A. C. Cheng, S. J. Peacock, and H. C. Prescott, "Pathophysiology, transmission, diagnosis, and treatment of coronavirus disease 2019 (COVID-19): a review," *JAMA*, vol. 324, no. 8, pp. 782–793, 2020.

[17] M. Nicola, "The emotional impact of COVID-19: from medical staff to common people," *Brain, Behavior, and Immunity*, 2020.

[18] J. L. Santarpia, D. N. Rivera, V. L. Herrera et al., "Aerosol and surface contamination of sars-cov-2 observed in quarantine and isolation care," *Scientific Reports*, vol. 10, no. 1, pp. 12732–12738, 2020.

[19] L. Bourouiba, "Turbulent gas clouds and respiratory pathogen emissions: potential implications for reducing transmission of COVID-19," *JAMA*, vol. 323, no. 18, pp. 1837-1838, 2020.

[20] S. Asadi, N. Bouvier, A. S. Wexler, and W. D. Ristenpart, "The coronavirus pandemic and aerosols: does COVID-19 transmit via expiratory particles?" *Aerosol Science and Technology*, 2020.

[21] C. Sun and Z. Zhai, "The efficacy of social distance and ventilation effectiveness in preventing COVID-19 transmission," *Sustainable Cities and Society*, vol. 62, Article ID 102390, 2020.

[22] L. Yang, J. Dai, J. Zhao, Y. Wang, P. Deng, and J. Wang, "Estimation of incubation period and serial interval of COVID-19: analysis of 178 cases and 131 transmission chains in hubei province, China," *Epidemiology and Infection*, vol. 148, p. e117, 2020.

[23] S. M. Moghadas, M. C. Fitzpatrick, P. Sah et al., "The implications of silent transmission for the control of COVID-19 outbreaks," *Proceedings of the National Academy of Sciences*, vol. 117, no. 30, pp. 17513–17515, 2020.

[24] G. Yin and H. Jin, "Comparison of transmissibility of coronavirus between symptomatic and asymptomatic patients: reanalysis of the ningbo COVID-19 data," *JMIR public health and surveillance*, vol. 6, no. 2, Article ID e19464, 2020.

[25] R. Verity, L. C. Okell, I. Dorigatti et al., "Estimates of the severity of coronavirus disease 2019: a model-based analysis," *The Lancet Infectious Diseases*, vol. 20, no. 6, pp. 669–677, 2020.

[26] S. Bialek, E. Boundy, V. Bowen et al., "Severe outcomes among patients with coronavirus disease 2019 (COVID-19)—United States, february 12-march 16, 2020," *MMWR Morbidity and Mortality Weekly Report*, vol. 69, no. 12, pp. 343–346, 2020.

[27] P. Ssentongo, A. E. Ssentongo, E. S. Heilbrunn, D. M. Ba, and V. M. Chinchilli, "Association of cardiovascular disease and 10 other pre-existing comorbidities with COVID-19 mortality: a systematic review and meta-analysis," *PLoS One*, vol. 15, no. 8, Article ID e0238215, 2020.

[28] C. Gebhard, V. Regitz-Zagrosek, H. K. Neuhauser, R. Morgan, and S. L. Klein, "Impact of sex and gender on COVID-19 outcomes in europe," *Biology of Sex Differences*, vol. 11, no. 1, pp. 29–13, 2020.

[29] M. Zanardo, C. Martini, C. Monti et al., "Management of patients with suspected or confirmed COVID-19, in the radiology department," *Radiography*, vol. 26, no. 3, pp. 264–268, 2020.

[30] S. Zhou, Y. Wang, T. Zhu, and L. Xia, "CT features of coronavirus disease 2019 (COVID-19) pneumonia in 62 patients in wuhan, China," *American Journal of Roentgenology*, vol. 214, no. 6, pp. 1287–1294, 2020.

[31] R. Lu, X. Zhao, J. Li et al., "Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding," *The Lancet*, vol. 395, no. 10224, pp. 565–574, 2020.

[32] S. Manna, J. Wruble, S. Z. Maron et al., "COVID-19: a multimodality review of radiologic techniques, clinical utility, and imaging features," *Radiology: Cardiothoracic Imaging*, vol. 2, no. 3, p. e200210, 2020.

[33] H. Y. F. Wong, H. Y. S. Lam, A. H.-T. Fong et al., "Frequency and distribution of chest radiographic findings in COVID-19 positive patients," *Radiology*, vol. 296, 2020.

[34] H. Dawit, M. Absi, N. Islam, S. Ebrahimzadeh, and M. D. F. McInnes, "Diagnostic accuracy of thoracic imaging modalities for the detection of COVID-19," *World Journal of Radiology*, vol. 14, no. 2, pp. 47–49, 2022.

[35] Y. Fang, H. Zhang, J. Xie et al., "Sensitivity of chest CT for COVID-19: comparison to RT-PCR," *Radiology*, vol. 296, 2020.

[36] A. Jacobi, M. Chung, A. Bernheim, and C. Eber, "Portable chest x-ray in coronavirus disease-19 (COVID-19): a pictorial review," *Clinical Imaging*, vol. 64, pp. 35–42, 2020.

[37] D. Nyirenda, R. Williams, and W. ten Ham-Baloyi, "Infection control recommendations for radiology departments in malawi," *Health SA=SA Gesondheid*, vol. 24, 2019.
[38] T. Modi, M. Verma, G. Ahuja, and D. Patkar, "COVID-19: how the radiology department should combat this global pandemic," *Journal of Clinical and Diagnostic Research*, vol. 14, no. 9, 2020.
[39] A. S. Adly, A. S. Adly, and M. S. Adly, "Approaches based on artificial intelligence and the internet of intelligent things to prevent the spread of COVID-19: scoping review," *Journal of Medical Internet Research*, vol. 22, no. 8, Article ID e19104, 2020.