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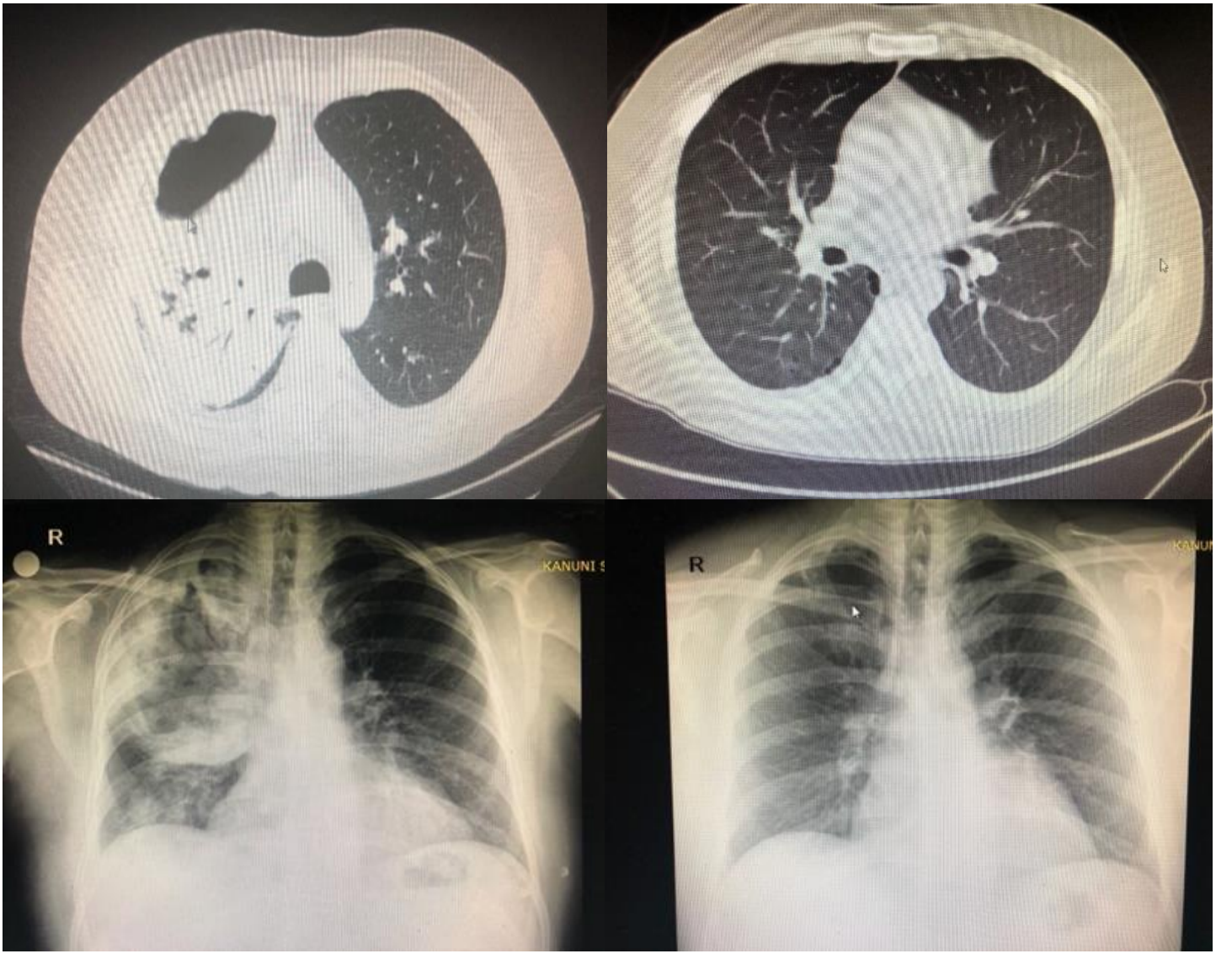

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The Experiences of Intensive Care Nurses in Caring for COVID-19 Patients: A review of the literature

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ABSTRACT

Objective: Intensive care nurses have a critical role in fighting COVID-19. They have been on the front lines to provide high-quality and safe patient care in these facilities. However, the covid-19 pandemic has made their work more challenging. As a result, healthcare workers' physical and mental well-being has affected their ability to offer quality care. Based on these arguments, there is a shortage of empirical research, especially in intensive care nurses' experiences caring for COVID-19 patients. However, further investigation is needed better to understand these concerns from the nurses' perspective.

Objective: To comprehensively review, describe, and explore the experiences and perceptions of nurses working in an ICU during the COVID-19 global pandemic and their assessments of how these experiences have impacted their personal and professional lives. Material and Methods: The following seven electronic databases were searched systematically to gain relevant studies: CINAHL, EMBASE, PsycINFO, MEDLINE, PubMed, the Cochrane Library and Web of Science. The literature review was the methodology guide for this study. This review used the PICOS (population, intervention, outcomes, and study design) model to formulate research questions and a PRISMA flow diagram to screen and select relevant studies. Eligible studies are written in the English language and are peer-reviewed. The methodological quality was assessed using the Joanna Briggs Institute (JBI) critical appraisal checklist for qualitative studies, while the Mixed Methods Appraisal Tool (MMAT) was used to evaluate mixed methods designs. The narrative synthesis techniques were used to present the findings.

Results: A total of 693 records have been screened, and only eight studies were finally included: six studies used qualitative approaches while two used mixed methods design approach. The eight studies were undertaken in SEVEN different geographic areas (Hong Kong, Iraqi Kurdistan, Singapore, Qatar, Australia, USA, Sweden). The eight studies recruited 420 registered nurses, of whom 67% were male (281) and 33% were female (139) aged between 20 to 60 years, and the mean of their experience was eight years. The review had four different themes from the analysis. The finding of the eight included studies related to the RN's experiences, which include psychological distress (depression, anxiety, post-traumatic stress disorder); stressful work environment.; experiences with personal protective equipment (PPE); moral resilience, sense of pride, and commitment.

Conclusion: ICU nurses may be considered a particularly vulnerable group of people. They reported increasing workloads in stressful and precarious situations and a challenge in their ability to make decisions independently. There is a need to explore additional aspects of their encounters further when caring for patients during the pandemic by going deeper into areas of their lives relevant to their experiences to understand the aspects that may not be addressed through quantitative methods.

Keywords: ICU; Nursing; COVID-19; Literature Review.

Review Article

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INTRODUCTION

The term "pandemic" refers to an outbreak of a disease that impacts a large number of people on a worldwide scale at the same time, resulting in many deaths and/or significant social and economic damage (1). Increased outbreaks of infectious diseases, such as SARS in 2003 (2), new influenza A/H1N1, and the Middle East Respiratory Syndrome of 2012, have indicated a possible worldwide pandemic (3).

This possibility was realised in December 2019 with the Corona Virus Disease 2019 (COVID-19) discovery in Wuhan, China (4). The seventh human coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was discovered in Wuhan, Hubei Province, China, following a recent pneumonia pandemic in January 2020. The virus spread throughout the world, infecting 4,806,299 people and killing 318,599 people as of May 20, 2020. SARS-CoV-2 and Middle East respiratory syndrome coronavirus (MERS-CoV) all induce severe pneumonia and have fatality rates of 2.9 %, 9.6 %, and 36%, respectively. OC43, NL63, HKU1, and 229E are the other four human coronaviruses that induce self-limited sickness with modest symptoms. COVID-19 has caused anxiety across many professions, across all disciplines, and throughout all international communities, independent of their economic or demographic characteristics (5).

COVID-19 represents a direct threat to the health and well-being of individuals in communities worldwide. These repercussions include job loss and its consequences for families, replacing in-person attendance to online and remote learning in the education sector, and numerous other changes in people's lives (6). Healthcare providers and the public are at higher risk of contracting the coronavirus disease-2019 (COVID-19) because it is highly contagious. Significant respiratory, cardiovascular, musculoskeletal, and psychological dysfunctions are of special concern (7). Additionally, pandemics have far-reaching consequences on healthcare systems, particularly the workforce (3). As the largest group of health professionals, nurses are at the front line of the healthcare system's response to pandemics. Nurses provide direct care to patients in proximity, and as a result, they are frequently exposed to these viruses that may make them sick (3). Four of the seventy people who died because of the SARS pandemic in Taiwan were nurses. Early studies on COVID-19 suggest that the virus's prevalence among healthcare workers may be significantly higher than previously thought (8).

Governments have made steps to decrease the number of people with COVID-19. Efforts to mitigate COVID-19's impacts have been insufficient. The countries affected by COVID-19 pleaded for help because of the massive damage the virus has caused to their healthcare systems and hospitals. Increased infections in some countries, such as Italy, indicated the need for immediate critical care. The number of patients remained steady or fluctuated in various countries, but there were significant impacts (6).

Medical institutions focus on treating infected or symptomatic patients in critical conditions. The capacity of a hospital to quickly recover from severe disturbances due to pandemics is referred to as resilience (6). Hospital resilience in the face of pandemics is influenced by the level of preparedness of the institutions. Resilience differs because hospitals are equipped differently. Better equipped healthcare facilities are likely to become resilient faster than poorly equipped ones. A lack of resilience affects the long-term viability of the healthcare system, which has implications for physicians, nurses, and other healthcare personnel (9). Effective pandemic management is contingent upon the preparedness of healthcare practitioners, particularly nurses. This means that, if anticipating a catastrophe or disaster is impossible, the responsible procedure should be implemented to carry out everything necessary to save lives after they occur.

During the initial wave of the coronavirus pandemic, the International Council of Nurses stressed the importance for healthcare systems worldwide to focus on increasing the capacity of intensive care units (ICUs). The ICUs needed to be prepared to cater to the growing number of coronavirus patients in need of critical healthcare services. Consequently, the ICU departments in hospitals worldwide have experienced increased pressure due to the growing demand for intensive care services, which has negatively impacted the lives of ICU nurses throughout the process of providing healthcare services for COVID-19 patients in critical health conditions (10).

The proposed literature review aims to fill a gap in knowledge about the professional life experiences and challenges of ICU nurses caring for COVID-19 patients during the pandemic. The initial studies on COVID-19 were mainly quantitative, reporting on a spate of surveys and focused on the degree of distress experienced by certain groups. Despite its significance, this research did not show ICU nurses' experiences on the front lines or their views of the kind of support that would be most useful at various stages of their careers. As countries worldwide continue to battle COVID-19 outbreaks, it is more critical to understand the views and needs of intensive care unit (ICU) nurses. This will become more critical in the future because of the likelihood of inevitable healthcare problems. The lack of information regarding the influence of the coronavirus pandemic and the challenges faced by ICU nurses globally has been a major gap worth studying. It is also a concern as the quality of healthcare in the identified location may be at risk of deterioration. Given the scarcity of information available on the challenges experienced by ICU nurses when providing care for COVID-19 patients, it is essential to undertake research with the aim of better understanding the current issues based on the nurses' lived experiences worldwide. Understanding nurses' experiences can allow vital action to be taken to reduce both the length of hospital stay for critically ill patients and the mortality rate caused by COVID-19. The main aim of the article was comprehensively review, summarise, and appraise the methodological quality of primary studies to describe and understand the experiences and perceptions of nurses working in ICU during the COVID-19 global pandemic.

MATERIAL and METHODS

Research design

A literature review conducted through a systematic review was utilised to explore evidence of nurses' experiences and perceptions of nurses working in an ICU during the COVID-19 pandemic and to provide a foundation of knowledge on the topic. Their recommendations for future intervention and strategies to improve this process that incorporated ICU nurses' experiences and allowed them to avoid obstacles throughout the COVID-19 pandemic and evaluation were also included in the review.

Searching Strategy Technique

To obtain the relevant studies, this study will conduct a comprehensive search using six databases, including web of science. Cumulative Index for Nursing and Allied Health Literature (CINAHL), EMBASE, PsycINFO, MEDLINE, PubMed, the Cochrane Library and Web of Science. Keywords elicited from the research questions were nurse OR Registered Nurse OR EN, Coronavirus disease OR COVID-19 OR SARS-CoV-2, and ICU OR High dependency unit OR critical care words, by using the PICOS Model to Conduct an Extensive Review. In addition to, there are numerous types of critical appraisal checklists, including the Critical Audit Skills Program (CASP), the Joanna Briggs Institute (JBI), and the Center for Evidence-based Medicine, which are deemed to be capable of offering critical assessment instruments (CEBM).

Inclusion Criteria

- The studies that addressed registered nurses (RNs) who cared for patients with COVID-19 in ICUs
- Studies that highlighted nurses' experience and perceptions when caring for patients with COVID-19,
- Primary research, e.g., qualitative, quantitative, or mixed-method design
- The studies selected must be published between 2020-2021
- Studies published in peer-reviewed journals
- The studies published in the English language
- Fully accessible studies

Exclusion Criteria

- Studies that addressed other healthcare professionals, even student nurses and in different healthcare settings rather than ICUs
- Studies that address other healthcare workers
- Any Secondary research, e.g. government reports, narrative reviews, scoping reviews, systematic reviews
- Studies that were published before the year 2010
- To be excluded from this list are meeting abstracts, proceedings (except those published in Procedia since it is peer-reviewed), master's or doctoral dissertations, other technical reports, and similar documents
- Studies published in other languages
- Non-accessible studies

RESULTS

A total of 693 studies were found after a thorough search of the databases. The studies were identified through the following databases: PubMed (n =141); CINAHL (n = 0); PsycINFO (n = 4); Cochrane Library (n = 139); Web of Science (n = 372); MEDLINE (via OVID) (n = 12); and Embase (via OVID) (n = 15); and an exhaustive manual search of the reference lists in studies (n = 10). The inclusion and exclusion criteria were applied to the 693 selected studies to identify the sub-sample to be used for the literature review. Duplicate studies were eliminated to ensure that only one of each study could be included in the systematic review (n = 386). Further studies were removed after the screening of the titles and abstracts (n = 197). Further studies were eliminated after the full-text screening to determine their relevance to the proposed topic of the systematic review (n = 43).

Further 46 studies were eliminated due to wrong study design (n = 9), wrong intervention (n = 8), wrong outcomes (n = 4), unclear outcome measures (n = 2), too small a sample size (n = 11), and studies that were ongoing at the time of the database search (n = 12). After the application of the eligibility and exclusion criteria, eight studies met the objectives of the systematic review and the pre-established criteria. The criteria of the 21 studies that remained in the evaluation process were selected. Figure 1 shows a research PRISMA flowchart for this search.

This literature review employed the Joanna Briggs Institute Critical Appraisal tools (JBI) critical appraisal tool to appraise each study for methodological quality by the researcher. It was verified by a second reviewer (the supervisor). With regards to mixed-method designs, the most recommended feasible tool is the Mixed Methods Appraisal Tool (MMAT), which can offer methodological quality criteria for a wide range of study designs but the researcher used it as a critical evaluation tool for mixed-method studies reviews (Hong et al., 2019). Each criterion was assigned a score (Yes =2, Unclear = 1, No = 0), which in turn gives an aggregated score of 20 for each study employed qualitative research design, a score of 17 for each study employed cross-sectional studies. After calculating the overall score for each included study, the score was converted into a %age. As a result, all study's scores ranged from 80 % to 100%. Hence, none of the studies was excluded based on methodological quality (see **Table 1** and **2**).

Participants and sample size

The outcomes showed the number of nurses recruited from the eight studies totalling 420 participants; the gender 67% are male (281), and 33% are female (139), and the years of experience ranged from 4-12 years and the mean of NRs' years of experience was eight years (**Table 3**).

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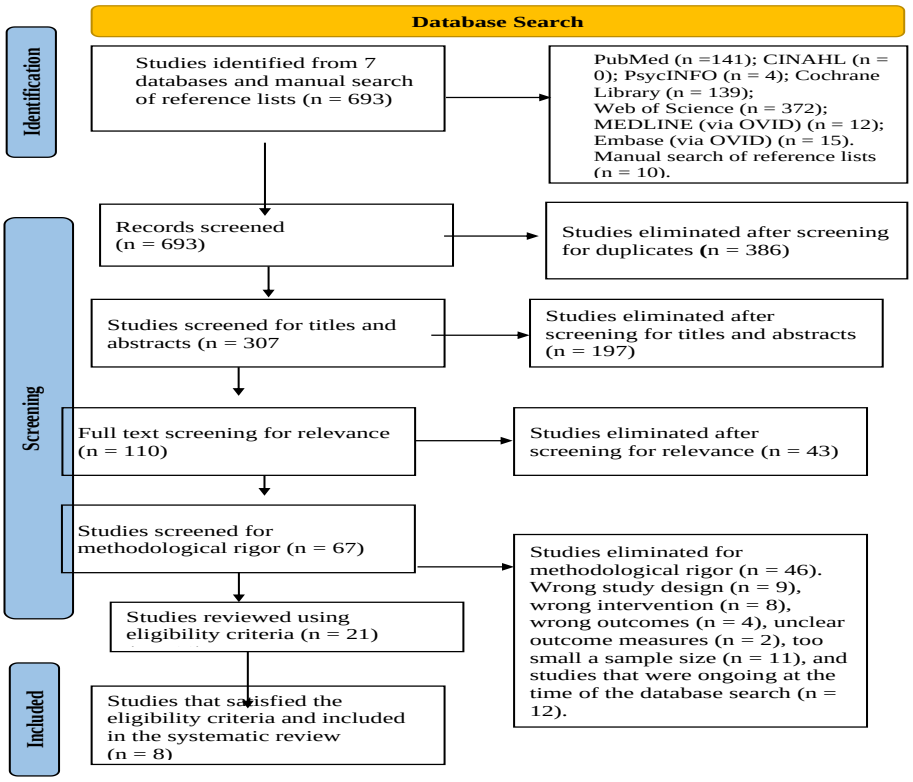

Figure 1: PRISMA flow diagram

Table 1: JBI critical appraisal checklist for eight qualitative research

Studies / Checklist for Qualitative Research Congruity	Abdulah, et al. (2021)	Lam and Hung (2013)	Wong et al. (2012)	Koh et al. (2012)	Villar et al., 2019	Corley et al. (2010)
Is there congruity between the stated philosophical perspective and the research methodology?	Y	Y	Y	Y	Y	Y
Is there congruity between the research methodology and the research question or objectives?	Y	Y	Y	Y	Y	Y
Is there congruity between the research methodology and the methods used to collect data?	Y	Y	Y	Y	Y	Y
Is there congruity between the research methodology and the representation and analysis of data?	Y	Y	Y	Y	Y	Y
Is there congruity between the research methodology and the interpretation of results?	Y	Y	Y	Y	Y	Y
Is there a statement locating the researcher culturally or theoretically?	Y	N	N	N	N	N
Is the influence of the researcher on the research, and vice-versa, addressed?	N	N	N	N	N	N
Are participants, and their voices, adequately represented?	Y	Y	Y	Y	U	U
Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	Y	Y	Y	Y	Y	Y
Do the conclusions drawn in the research report flow from the analysis or interpretation of the data?	Y	Y	Y	Y	Y	Y
Results (%)	**18/20 (90%)**	**16/20 (80%)**	**16/20 (80%)**	**16/20 (80%)**	**15/20 (75%)**	**15/20 (75%)**
The final decision was taken by the researcher	**Included**	**Included**	**Included**	**Included**	**Included**	**Included**

Table 2: Mixed Methods Appraisal Tool (MMAT), version 2018 for two Mixed Methods designs

Category of study designs	Methodological quality criteria	LoGiudice et al. (2021)	Bergman et al. (2021)
Screening questions	**Are there clear research questions?**	Y	Y
	Do the collected data allow to address the research questions?	Y	Y
Qualitative	Is the qualitative approach appropriate to answer the research question?	Y	Y
	Are the qualitative data collection methods adequate to address the research question?	Y	Y
	Are the findings adequately derived from the data?	Y	Y
	Is the interpretation of results sufficiently substantiated by data?	N	N
	Is there coherence between qualitative data sources, collection, analysis and interpretation?	N	N
Quantitative descriptive	Is the sampling strategy relevant to address the research question?	Y	Y
	Is the sample representative of the target population?	Y	Y
	Are the measurements appropriate?	Y	Y
	Is the risk of nonresponse bias low?	U	U
	Is the statistical analysis appropriate to answer the research question?	Y	Y
Mixed methods	Is there an adequate rationale for using a mixed method design to address the research question?	**Y**	**Y**
	Are the different components of the study effectively integrated to answer the research question?	**Y**	**Y**
	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	**Y**	**Y**
	Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	**Y**	**Y**
	Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	**U**	**U**
	Results (%)	**14/17 (82%)**	**15/17 (88%)**
	The final decision was taken by the researcher	**Inducted**	**Inducted**

Noted: the goal of scoring system Yes =2 marks, Unclear = 1 mark, No = 0 marks

Table 3: Participants and sample size,

Authors	Male N (%)	Female N (%)	Total N	Age (range) years	Years' experience
1. Abdulah et al. (2021)	8 (67)	4 (33)	12	22-50	8
2. Lam and Hung (2013)	0 (0)	10 (100)	10	20-40	4
3. Wong et al. (2012)	1 (33)	2 (67)	3	31-37	4
4.Koh et al. (2012)	5 (50)	5 (50)	10	20-40	4
5. Villar et al., 2021	26 (87)	4 (13)	30	30-50	8
6. Corley et al. (2010)	10 (33)	20 (67)	30	40-60	12
7. LoGiudice et al. (2021)	20 (47)	23 (53)	43	40-60	12
8. Bergman et al. (2021)	100 (35)	182 (65)	282	35-60	10
Total	**170 (40)**	**250 (60)**	**420**	-	**8**

DISCUSSION

They were used to accomplish the aim of conducting a comprehensive review and evaluating the methodological quality of primary studies to describe and comprehend the experiences and perceptions of nurses working in an ICU during the COVID-19 global pandemic.

The aim of the study by Abdulah et al. (2021) (11) was to explore the experiences of nurses involved in caring for patients diagnosed with COVID-19 in Iraqi Kurdistan. The data were analysed through thematic analysis. The researchers found that nurses had varied experiences, the first of which was ignorance about the virus that stemmed from the fact that many people doubted the existence of the coronavirus. Consequently, nurses were met with aggression from patients and their family members when they attempted to impart knowledge. The researchers also reported that the nurses experienced anxiety, fear, stress, and isolation during the period when they were caring for patients diagnosed with COVID-19. These challenges were partly because of fear by family members and close friends that the nurses caring for patients diagnosed with COVID-19 would bring the virus home.

The study by Wong et al. (2012) (12) focused on the healthcare workers' concerns when caring for patients diagnosed with the H1N1 virus. The researchers used a qualitative study methodology which data was collected through one-to-one interviews. The researchers found nurses shared concerns ranging from the poor layout of the facilities, frequent changes of policies, the efficacy of their interventions, and an appreciation for the risky but necessary work they were doing. The researchers also reported that the nurses were concerned about the efficacy of the vaccines given as well as their side effects, the stress associated with duty roles, and lack of clarity about criteria for case management.

The study by Lam and Hung (2013) (13) focused on Hong Kong emergency nurses to understand their perceptions about their duties in caring for patients diagnosed with human swine influenza during its pandemic outbreak. The researchers used an exploratory qualitative methodology based semi-structured interviews to collect data. The analysis of the interview transcripts was performed using the qualitative content analysis method. The findings identified three themes, namely, concerns from the emergency nurses about health, attitudes about professionalism, and administration.

The study by Koh et al. (2012) (14) focused on Chinese Singaporean nurses to understand their perceptions regarding the risks associated with exposure to virulent respiratory infections diseases. The researchers also sought to understand the underlying factors for their risk perceptions. They performed a qualitative study in which they used face-to-face interviews for data collection. The thematic analysis was used and identified three themes, namely, acceptance of risk, the experience of the Severe Acute Respiratory Syndrome, and living with risk.

The study by Villar et al. (2021) (15) focused on frontline nurses to understand their lived experiences in caring for patients diagnosed with COVID-19 in Qatar. The researchers used the phenomenological research design of the qualitative methodology. The researchers collected data using face-to-face interviews and semi-structured interview schedules. After transcription of the interviews, the researchers used Colaizzi's phenomenological method for data analysis. The researchers identified three themes, including challenges associated with working in a facility designated for the treatment of patients diagnosed with COVID-19, surviving COVID-19 and the moral resilience of nurses.

The study by Bergman et al. (2021) (16) focused on registered nurses working in ICUs in Sweden to understand their experiences in caring for patients diagnosed with COVID-19. The researchers used a mixed-method survey design. Findings from the qualitative data showed three themes, namely, tumbling into chaos, diminished nursing care, and transition into pandemic ICU care. The themes highlighted the low priority rank of nursing care during the COVID-19 pandemic. The nurses experienced ethical stress because of the low-quality nursing care they provided. The themes also highlighted the effects of the worsening work environment and increased workload on the health and well-being of the nurses.

The study by LoGiudice and Bartos (2021) (17) explored the lived experiences of nurses to characterise their experiences while caring for patients diagnosed with COVID-19 and the reason for their underlying resiliency. The researchers employed a convergent mixed methods research design. The researchers used Colaizzi's phenomenological method to perform the qualitative component of the study. The themes emerging from the qualitative analysis included broken family ties, the sanitising cycle, restorative self-care, and pride in the nursing profession.

The study conducted by Corley et al. (2010) (18) explored the lived experiences of the medical and nursing staff assigned to care for patients diagnosed with H1N1 influenza in ICUs. The researchers used a phenomenological research design with focus group discussions and open-ended questionnaires. The researchers used Colaizzi's framework to analyse the qualitative data. The themes included the use of personal protective equipment (PPE), the adequacy of staffing levels in ICUs, fear of getting infected with and transmitting the viral disease, procedures for infection control, staff morale, new roles for the medical and nursing staff, challenges related to patient care, and education on the oxygenation of the extracorporeal membrane

The researcher used a narrative synthesis of the results in the form of four different themes, including psychological distress, stressful work environment; experiences with personal protective equipment (PPE); moral resilience, sense of pride and commitment, as the following:

Psychological distress

Fear, stress, anxiety, and isolation describes part of the experiences of nurses when caring for COVID-19 patients in ICUs. Nurses were given new roles, some for which they had not been trained. Consequently, many nurses experienced stress and anxiety related to their duty roles (8). Stress and anxiety also emerged from the fear of getting infected with COVID-19 during routine care practices (11, 15, 18). The fear of inevitably transmitting the virus to family members also leads to isolation (11, 18). Nurses also experienced ethical stress stemming from the provision of low-quality patient care (16).

Stressful work environment

The experiences of nurses are also related to the stressful work environment. COVID-19 brought about several changes in the work processes and environment for healthcare workers. Some of the experiences identified in the literature include frequent changes in policies (12). There were also concerns about a stressful work environment (17), with the influencing factors including inadequate staff in ICUs (18, 13), lack of clarity about criteria for case management (12), and the high risk that the nursing profession predisposes nurses (14). They also included the new roles that the nursing staff had to assume, leading nurses to work in new contexts and a high workload (15, 16, 18).

Experiences with personal protective equipment (PPE)

With the viral respiratory infections being very infectious, experiences with personal PPE were a recurrent theme in the experiences of nurses caring for COVID-19 patients. The literature highlighted the use of personal protective equipment (PPE), sanitisation, and restorative self-care as part of the experiences for nurses when caring for patients diagnosed with COVID-19 (13, 15, 17, 18). However, this was not a positive experience for all despite offering protective benefits. Some nurses highlighted the discomfort of having to wear PPE during patient care processes (15).

Moral resilience, sense of pride and commitment.

The COVID-19 pandemic brought insurmountable challenges for workers in many professions. Corley et al. (2010) (18) highlighted issues of staff morale during outbreaks and pandemics. The challenges during patient care (12, 18) and the stress, anxiety, and fear the nurses, among other healthcare workers, felt (11, 15, 16, 18) were enough to affect their commitment to their profession. However, the literature shows that the nurses took pride in their profession despite all

the challenges and concerns (17). The literature also showed that the nurses were committed to their work (13). They developed resilience (17) and some felt that they had a true calling for their profession because it gave them a sense of purpose (15). They drew support from other colleagues during times of mental and physical hardship (15).

CONCLUSION

ICU nurses may be considered a particularly vulnerable group of people. They reported increasing workloads in stressful and precarious situations and a challenge in their ability to make decisions independently. There is a need to explore additional aspects of their encounters further when caring for patients during the pandemic by going deeper into areas of their lives relevant to their experiences to understand aspects that may not be addressed through quantitative methods.

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Author Contributions: KM: Study design, Literature review, Data collection and processing, **KM:** Writing, Revisions

Ethical approval: All procedures performed in studies involving human participants were in accordance with the institutional and/or national research committee's ethical standards and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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Effect of Covid-19 Pandemic on Surgical Pathology and Cytopathology referrals for Detection of Malignancy

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ABSTRACT

Objective: This study aims to investigate the effect of the pandemic on the detection of diseases through the materials sent to the pathology laboratory, especially the malignant patient group.

Material and Methods: According to official data, the first Covid-19 patient was detected in our country on March 11 2020. All materials that came to the pathology laboratory between 11 March-10 April 2020 and 11 March-10 April 2019 were included into the study. The age, gender, material and diagnoses of the patients were recorded. The pre-pandemic period and post-pandemic period were analyzed statistically.

Results: Cases divided into five diagnostic groups as benign (92.9%), malignant (2.8%), pre-malignant (2%), atypia of uncertain significance (1.4%) and inadequate (0.9%). Although a numerical decrease was detected in all groups, statistically significant decrease was detected in the benign (p=0.001), malignant (p=0.001), and atypia of uncertain significance (p=0.047). According to the types of materials, the first five materials most frequently sent before the pandemic are smears (31.3%), gastric biopsy (18%), curettage(9%), gallbladder resections(5.2%), and skin biopsies(4.5%). After the pandemic, smears (29.8%), stomach biopsies (17.6%), curettage (10.2%), gallbladder (5.2%) and appendectomies (5.2%) are respectively. Materials with statistically significant reductions were skin biopsies (p=0.006), thyroid fine needle aspiration biopsies (p=0.018), and abortions (p=0.025).

Conclusion: It can be argued that the unknown and devastating effect of the pandemic is felt intensely, especially in malignant group, where early diagnosis and treatment are important. We would like to emphasize the necessity of putting B plans in global events such as pandemics to prevent any disruption in cancer screening programs in these special groups.

Keywords: covid19, pandemic, pathology, cytopathology

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INTRODUCTION

Since December 2019, the world has been dealing with the pandemic that has delayed other health problems (1). With the Covid-19 pandemic, governments have taken precautions such as social distance, travel restrictions and quarantine (2). It was thought that these preventions taken to protect public health caused other problems by interrupting cancer screening programs along with the recommendation of non-emergency patients to delay their admission to the hospital. It is predicted that delays in diagnosis cause patients to be caught at more advanced stages and lead to the worse clinical outcome (3). There are some differences in cancer screening programs between countries. In our country, there are approaches for early detection of breast, cervical, and colorectal cancers in the cancer screening program published by the Cancer Department of the Ministry of Health, General Director of Public Health. For breast cancer, it is recommended that the individual physical examination monthly, annual clinical examination, and a mammogram every two years between the ages of 40-69.

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For the detection of colorectal cancer, in addition to fecal occult blood test every two years for individuals aged 50-70, colonoscopy is performed every ten years for the same age group. In cervical cancer screening, it is recommended to take a smear every five years from women between the ages of 30-65 and to have an HPV-DNA test. These approaches are reflected in the pathology laboratory by sending tru-cut biopsy, lumpectomy and mastectomy, colon biopsy, colon resection materials and smears. It is thought that with the pandemic, disruptions in these screening programs are also experienced.

The aim of this study is to investigate the effect of the pandemic on the detection of diseases through the materials sent to the pathology laboratory, especially the malignant patient group.

MATERIAL and METHODS

Ethics committee decision was taken for the study (No: 2022/4-4). According to official data, based on the date of March 11 2020, when the first Covid-19 patient was detected in our country, all of the patients' material which came to the pathology laboratory between 11 March-10 April 2020 and 11 March-10 April 2019 were included in the study. The patients' age, gender, material type and diagnoses were found and recorded. Diagnoses were divided into five categories as benign, pre-malignant, malignant, atypia of undetermined significance and inadequate. Diagnosis of atypia of undetermined significance used in the presence of atypical squamous cells of undetermined significance (ASC-US) in smears, and in the presence of atypical cells of undetermined significance/follicular lesion of uncertain significance in thyroid fine-needle aspiration biopsies. The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0 software (SPSS Inc., Chicago, IL, USA). The compatibility of numerical variables to normal distribution was assessed using Kolmogorov-Smirnov test. Results were presented as frequencies and percentages for categorical variables, and as medians and interquartile ranges for numerical data. The Mann-Whitney U test was used to compare numerical variables, while the Chi-square or Fisher's Exact test was used for comparing categorical data. A p-value of <0.05 was considered acceptable for statistical significance.

RESULTS

While the number of cases in our laboratory was 1359 before the pandemic, it decreased to 363 after the pandemic. Materials of female patients are three times more common than men. Groups were most frequently diagnosed as benign (92.9%), followed by malignant (2.8%), pre-malignant (2%), atypia of undetermined significance (1.4%), and inadequate (0.9%) (**Table I**).

Table I: Descriptive features of the cases

		n	%
Sex	Female	1294	75.1
	Male	428	24.9
Period	Before pandemic	1359	78.9
	After pandemic	363	21.1
Diagnosis	Benign	1600	92.9
	Malignant	48	2.8
	Pre-malignant	34	2.0

While 1277 cases were diagnosed as benign before the pandemic, this number decreased to 323 after the pandemic, and a statistically significant decrease was detected (p=0.001). While 29 patients (2.1%) were diagnosed as malignant before the pandemic, the number decreased to 19 (5.2%) after the pandemic, and a statistically significant decrease was detected (p=0.001).

While the cases diagnosed as pre-malignant were 24 (1.8%) before the pandemic, they decreased to 10 (2.8%) after the pandemic, but there was no statistically significant decrease (p=0.229). Patients diagnosed with atypia of undetermined significance showed a statistically significant decrease (p=0.047) from 15 (1.1%) before the pandemic to 9 (2.5%) after the pandemic (**Table II**)

According to the types of materials, the first five materials most frequently sent before the pandemic are smears (31.3%), gastric biopsies (18%), curettages (9%), gallbladders (5.2%) and skin biopsies (4.5%). After the pandemic, smears (29.8%), stomach biopsies (17.6%), curettages (10.2%), gallbladders (5.2%), and appendectomies (5.2%) are respectively. Materials in which statistically significant reductions were observed at skin biopsies (p=0.006), thyroid fine needle aspiration biopsies (p=0.018) and abortions (p=0.025) (Table III).

Table 2: Comparison of pre- and post-pandemic tumor type

		Period					
		Pre-pandemic		Post-pandemic			
		n	%	n	%	χ^2	p
Benign	**Absent**	82	6.0	40	11.0	10.816	**0.001**
	Present	1277	94.0	323	89.0		
Malign	**Absent**	1330	97.9	344	94.8	10.161	**0.001**
	Present	29	2.1	19	5.2		
Pre-malign	**Absent**	1335	98.2	353	97.2	1.447	0.229
	Present	24	1.8	10	2.8		
Undetermined	**Absent**	1344	98.9	354	97.5	3.944	**0.047**
	Present	15	1.1	9	2.5		
Insufficient	**Absent**	1345	99.0	361	99.4	0.715*	0.547
	Present	14	1.0	2	0.6		

χ^2: Chi-Square test.*: Fisher's Exact test

Table 3: Comparison of processes concerning period

		Period					
		Pre-pandemic		Post-pandemic			
		n	%	n	%	χ^2	p
Curettage	**Absent**	1237	91.0	326	89.8	0.505	0.477
	Present	122	9.0	37	10.2		
Appendectomy	**Absent**	1314	96.7	344	94.8	2.960	0.085
	Present	45	3.3	19	5.2		
Intervertebral disc excision	**Absent**	1326	97.6	355	97.8	0.062	0.803
	Present	33	2.4	8	2.2		
Gastric Biopsy	**Absent**	1114	82.0	299	82.4	0.031	0.861
	Present	245	18.0	64	17.6		
Skin Biopsy	**Absent**	1298	95.5	358	98.6	7.523	**0.006**
	Present	61	4.5	5	1.4		
Prostate Tur	**Absent**	1337	98.4	359	98.9	0.515	0.473
	Present	22	1.6	4	1.1		
Thyroid fine needle aspiration	**Absent**	1324	97.4	361	99.4	5.584	**0.018**
	Present	35	2.6	2	0.6		
Soft tissue excision	**Absent**	1302	95.8	348	95.9	0.003	0.958
	Present	57	4.2	15	4.1		
Colon biopsy	**Absent**	1327	97.6	351	96.7	1.041	0.308
	Present	32	2.4	12	3.3		
Bladder biopsy	**Absent**	1344	98.9	356	98.1	1.545	0.289*
	Present	15	1.1	7	1.9		
Smear	**Absent**	933	68.7	255	70.2	0.340	0.560
	Present	426	31.3	108	29.8		
Tubal ligation	**Absent**	1346	99.0	356	98.1	2.357	0.162*
	Present	13	1.0	7	1.9		
Abortion	**Absent**	1336	98.3	350	96.4	4.993	**0.025**
	Present	23	1.7	13	3.6		

χ^2: Chi-Square test.*: Fisher's Exact test

DISCUSSION

Covid-19, caused by SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2), first appeared in Wuhan, China, in December 2019 and turned into a pandemic by spreading all over the world (4). According to official data, the first Covid-19 case in Turkey occurred on March 11, 2020, and the first death occurred on March 15, 2020. On April 1, 2020, it was announced that the coronavirus had spread all over Turkey. The scientific committee recommended some measures such as quarantine, postponement of non-emergency elective surgeries, and restriction of hospital admission for health problems that could be postponed to reduce the hospital burden. Because of the fear, panic, and scientific committee recommendations, patients' hospital admissions, surgeries, and materials sent to the pathology laboratory have also decreased.

Pelsemaeker et al. compared the workload of the pathology laboratory with the pre-pandemic period, taking into account the number of preparations, the number of blocks, the type of materials sent based on pathology and molecular tests. In March, they found that the total number of samples in January and February of the same year decreased by 35% and 40-45% compared to March of the previous three years. Responsible personel observed a numerical decrease in each type of material that came to the laboratory. Still, they found that this decrease was not statistically significant in prostate biopsies, appendectomies, lower gastrointestinal resection materials, bone marrow biopsies, and central nervous system samples (2).

In the study conducted by Rosas et al. in Latin America, they compared the pathology materials in the 2.5-month period when the pandemic started and the same period of 2019 and found that the number of samples decreased (1).

In this study, numerical decreases were observed in each material type, and a statistically significant decrease was found only in skin biopsies, thyroid fine-needle aspiration biopsies and abortions.

Kaufman et al. compared the change in the number of newly diagnosed cancer patients before and during the pandemic. In their study, 75% of the patients were women, and they found a significant decrease in six common cancer types (breast, colorectal, lung, pancreas, stomach and esophagus). They suggested that the delay in diagnosis may lead to a lower life expectancy by catching patients at a later stage (3). In our study, 75.1% of the patients were women, and a statistically significant decrease was found in patients diagnosed with atypia of undetermined significance and malignant. Before the pandemic, the most frequently encountered cancers were bladder (10 cases), skin (6 cases), stomach (3 cases), and lymph nodes (3 cases), while after the pandemic, bladder (6 cases), colon (4 cases) and breast (4 cases) changed too. While there were fourteen colon biopsies diagnosed as pre-malignant before the pandemic, this number decreased to four after the pandemic. The cases diagnosed as pre-malignant in the smears performed for cervical cancer screening were four before, and three after the pandemic. Before the pandemic, twelve of the fifteen cases were smeared and three of them were thyroid fine-needle aspirations in the atypia of

undetermined significance group. No fine-needle aspiration biopsy has been sent after the pandemic, and it all consists of smears.

Miller et al. also investigated the effect of the pandemic on cervical cancer screening according to age group and ethnicity, and found a decrease in the pandemic period compared to the pre-pandemic period, regardless of age group and ethnicity (5). In our study, although a numerical decrease was observed in the smear material, no statistically significant (p=0.560) decrease was detected. This suggests that our cervical cancer screening program has not been statistically interrupted despite the pandemic.

CONCLUSION

There was a statistically significant decrease in the number of patients diagnosed with malignant and atypia of undetermined significance compared to the pre-pandemic period. In these groups, especially malignant, where early diagnosis and treatment are ofhas vital, the pandemic's unknown and devastating effect is felt intensely, and the pandemic has delayed the patients' admission to the hospital, causing the patients to be diagnosed at a later stage. We would like to emphasize the necessity of putting B plans into action in global events such as pandemics that affect the whole world, so as not to disrupt cancer screening programs in these special groups.

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Author Contributions: GTY: Study design, Literature review, Data collection and processing, **GTY:** Writing, Revisions

Ethical approval: All procedures performed in studies involving human participants were in accordance with the institutional and/or national research committee's ethical standards and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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Effects of the Fear of COVID-19 on Professional Perception among Nursing Students: A Cross-sectional Study

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ABSTRACT

Objective: The impact of a pandemic on psychological health is an essential factor in determining professional perception. This study aims to evaluate the fear of COVID-19 and the perception of the nursing profession and examine the relationship between them.

Material and Methods: This study was conducted as a cross-sectional design using self-report questionnaires distributed to 976 nursing students in Turkey.

Results: The findings showed that students' COVID-19 fear levels in the present study were moderate, and their perceptions of the nursing profession were positive. There was a weak and positive correlation between the students' COVID-19 fear and the total score averages of the Nursing Profession Perception Scale.

Conclusion: There was a two-way relationship between professional perception and fear of COVID-19. The education programs need to be ready to prepare future nurses to deal with future novel pandemics and increase the perception of the profession.

Keywords: Fear, COVID-19, perception of the nursing profession, pandemic, nursing students

INTRODUCTION

Throughout history, epidemics have been a cause of fear at both individual and social levels due to their structures that change daily life practices, increase the need for medical help, cause high rates of morbidity and mortality, and create uncertainty (1). Similarly, the novel coronavirus infection (COVID-19), which led to a worldwide pandemic for the last three years, has been described as a public health emergency that deeply affects the social and economic order, threatens the lives of individuals, damages the sense of trust, questions values, creates a perception of threat by causing an environment of uncertainty, and raises fear and anxiety at the international level (2-4). Globally, there were 340.543.962 confirmed cases of COVID-19, including 5.570.163 deaths, reported to WHO as of 21 January 2022. In Turkey, as of the same date, there were 10.735.324 confirmed cases of COVID-19, with 85.419 deaths reported (5).

The fear of COVID-19, one of the important psychological aspects of the COVID-19 pandemic, is a significant factor in stress, anxiety, substance use (6), risk of uncertainty (7), suicide attempts (8), panic (9), stigma and exclusion (10), irrational and ambiguous thoughts (2).

Although nursing students are not frontline health workers, the role of nurses in the COVID-19 pandemic is critical due to several factors: newly graduated nurses starting to work in clinics where patients with a diagnosis of COVID-19 are being treated to meet the need for nurses quickly, caring for COVID-19 positive patients, the risk of contamination, loss nurses' lives, social isolation. Hence, nursing students worry about their health and have concerns about the nursing profession they will perform in the future (11-13). A study reported that the health anxiety levels of nursing students are high due to COVID-19 (14). Medina-Fernandez et al. (2021) stated that nursing students and recent graduates have high levels of stress and fear, besides a low level of knowledge (15). Martínez-Lorca et al. (2020) found that students enrolled in health science education display more fear of the COVID-19 pandemic than other students from other degree programs (16). According to Dost et al. (2021), on the other hand, the findings showed that during the COVID-19 pandemic, senior nursing students' perceptions of their professional image were at a good level, but their anxiety and fear levels were high (17).

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Caliskan et al. (2021) found that positive attitudes toward the nursing profession in nursing students decreased as the fear of COVID-19 increased (18). On the other hand, the importance of the nursing profession and nursing care has come to the fore again due to the prominence of the concept of "care" in parallel with the increase in the number of patients in intensive care with the pandemic. In addition, the year 2020 was declared the "year of nurses and midwives" by the World Health Organization due to the following reasons: the increase in the visibility of nurses in the media during the pandemic period, the appreciation of health workers by society by being declared heroes, and the respect of the whole world for nurses who do their profession with great devotion and self-sacrifice.

This factor has an impact on students' professional feelings and thoughts. Perceptual awareness and sensitivity are as significant as scientific competence for excellence in nursing practice and education. Professional perception will develop positively in the education process (19). In this respect, it is crucial to know the level of students being affected by the fear of COVID-19 and how the pandemic affects their professional perceptions to prevent them from forming negative attitudes in the future.

This research aims to evaluate the fear of COVID-19 and the nursing students' perception toward the nursing profession during the COVID-19 pandemic and examine the relationship between these two situations.

MATERIAL and METHODs

Research design

This was a cross-sectional study employing self-report questionnaires.

Setting and data collection

This study took place between March and May 2021 with 976 nursing students at a nursing faculty in Aydın, Turkey. An online survey link (Google doc) was forwarded to the students.

Participants

In the present study, 976 (N=1192) nursing students from different year levels participated; the response rate was 81.8%. The students above 18 years old who consented to participate were in the present study.

Instrumentations

Data for the current study were collected utilizing the Student Information Form, The Fear of COVID-19 Scale, and The Nursing Profession Perception Scale. It took approximately 15 minutes for students to fill out the questionnaires.

Student Information Form: The researchers developed this form in line with the literature to determine demographic characteristics (20-24). It contained 28 questions. The questions were on the following subjects: the socio-demographic characteristics of the students (e.g., age, sex, graduated high school, year level, and place of residence), the status of having COVID-19 infection (e.g., being infected, losing a relative due to COVID-19) and their thoughts on the profession (e.g., liking the profession and willingness to work in the profession).

The Fear of COVID-19 Scale: Ahorsu et al. (2020) developed this scale to measure the COVID-19 fear levels of individuals (2). The Turkish adaptation of the scale was by Ladikli et al. (25). The applicable age range of the scale is wide and appropriate for university students and adults. The scale has seven items and uses a five-point Likert scale, where participants scored from 1 strongly disagree to 5 strongly agree. Possible scores range from 7 to 35. A high score on the scale indicates a high level of fear. Cronbach alpha internal consistency coefficient of the scale was 0.82 (25), and in the present study, the total scale item internal consistency coefficient was calculated as 0.87.

Nursing Profession Perception Scale (NPPS): NPPS was from Eser et al. (26). The scale has 22 items and uses a five-point Likert scale, where participants scored from 1 strongly disagree to 5 strongly agree. The scale has two sub-dimensions: Professional qualifications (17 items) and Professional status (5 items). The total score obtained from the scale varies from 22 to 110. The increase in the total score obtained from the scale indicates that the perception of the profession is positive. Cronbach's alpha coefficient of the scale was 0.83, and Cronbach's alpha coefficients of the subscales were 0.85 for Professional Qualifications and 0.79 for Vocational Status, respectively (26). In this study, Cronbach's alpha coefficient of the scale was 0.93, and Cronbach's alpha coefficients for the sub-dimensions were 0.94 for Professional Qualifications and 0.80 for Vocational Status.

Data analysis

To perform the statistical analysis for the present study, the authors utilized the Statistical Package for Social Science (SPSS 22.0) software program. The descriptive statistics were provided in a number and percentage format, and the Skewness, Kurtosis values were used for examining a normal distribution of variables. Between -2 and +2 values were accepted as a normal distribution (27). The comparison between the nursing students' profiles and key variables of the present study was analyzed using the Mann-Whitney U test for binary groups and the Kruskal-Wallis test for triple groups. The correlation between fear of COVID-19 and the nursing profession was analyzed by Spearman's rho coefficients. The statistical significance threshold was $p<0.05$.

Ethical consideration

The ethical review boards approved this study of a university (Approval Number: 2021-223). The necessary permissions were obtained from the school authorities before conducting this study. The necessary permission to utilize the scales discussed previously in this study was received from the authors. All students were accepted voluntarily to participate in the present study, and they were informed about the purpose of this study.

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RESULTS

The average age of the student participants was 20.38±1.62, more than half of the students were female, and 38.1% had a nurse in their family. Most of them were graduates of regular vocational high schools and were chosen with their own request for the nursing profession. Approximately half of them reported that they chose the nursing profession because of the job guarantee and wanted to become a clinical nurse after graduation (Table 1).

In this study, 14.8% of the students and 36.5% of their family members had COVID-19 infection, and 9.4% lost a relative due to COVID-19. 37.2% of the students stated that the COVID-19 pandemic negatively affected their thoughts about the nursing profession, while 77.8% of the students thought that the infection had a positive effect on the perception of the nursing image in society. About half of the students stated that they would like to choose the nursing profession again if they had the chance to take the university exam again after the COVID-19 pandemic, and the vast majority of them did not plan to drop out of school due to COVID-19 (Table 2). The mean score of the students participating in this study on the Fear of COVID-19 Scale was 15.79±5.99 (Table 3). While the total mean scores of the COVID-19 Fear Scale were significantly higher for female students, it was significantly lower for students living in urban areas than those living in rural areas ($p<0.05$) (Table 1). The level of fear was significantly higher in students who stated that the COVID-19 pandemic negatively affected their thoughts about the nursing profession and considered dropping out of school ($p<0.05$, Table 2).

The total mean score of the Nursing Profession Perception Scale of the students was 88.56±15.57, and the mean score of the sub-dimension of NPPS was 67.96±12.40 for the "professional qualifications" sub-dimension and 20.60±3.76 for the "professional status" sub-dimension (Table 3).

The total mean score of the students' Nursing Profession Perception Scale was significantly higher in women, a vocational school of health graduates, and students who stated that they chose the nursing department willingly ($p<0.05$). In addition, the Professional Perception mean scores of the senior students were significantly higher than the first-year students ($p<0.05$). Professional Perception mean scores of students who stated that they chose the nursing profession because of job guarantee were significantly higher than students who chose the nursing department because they liked nursing or because their families wanted it ($p<0.05$). On the other hand, the professional perception point averages of the students who stated that they would not be a nurse after graduation were significantly lower ($p<0.05$), (Table 1). In addition, the professional perception levels of the students who did not have a history of COVID-19 infection in their family members and the students who stated that they did not want to leave school were significantly higher ($p<0.05$). Also, the professional perception levels of the students who stated that they would like to choose the nursing profession again if they had the chance to take the university exam again after the COVID-19 pandemic were significantly higher ($p<0.05$). The professional perception levels of the students who thought that the pandemic had a positive effect on the nursing profession and the image of the profession in society were significantly higher ($p<0.05$, Table 2).

Given that the students themselves had a COVID-19 infection, had a nurse relative in their family, and lost a relative due to COVID-19 did not have a statistically significant effect on the level of professional perception and fear ($p>0.05$).

There was a weak and positive correlation between the students' fear of COVID-19 and the total mean score of the Nursing Profession Perception Scale ($r= 0.084$, $p=0.019$) (Table 4).

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Table 1. Comparison of Nursing Students' Fear of COVID-19 Scale with NPPS and Sub-dimension Scores according to Descriptive Features

Descriptive Features (n=976)	n	%	Fear of COVID-19 Scale Total Score Mean±SD	NPPS Total Score Mean±SD	NPPS Sub-dimensions Professional Status Mean±SD	NPPS Sub-dimensions Professional Qualifications Mean±SD
Sex[a]						
Female	667	68.3	16.69±5.68	91.18±12.41	21.14±3.06	70.03±9.97
Male	309	31.7	13.83±6.18	82.91±19.68	19.42±4.72	63.48±15.56
Z			-7.792	-6.537	-5.215	-6.408
p			**0.000**	**0.000**	**0.000**	**0.000**
Lives in[b]						
City	429	44.0	15.00±5.72	88.75±14.60	20.62±3.62	68.13±11.53
Town	384	39.4	16.32±6.05	88.62±16.19	20.54±3.84	68.08±12.89
Village	163	16.6	16.57±6.28	87.89±16.56	20.66±3.91	67.23±13.40
X^2			11.853	0.888	0.574	0.984
p			**0.003**	0.642	0.750	0.611
Graduated high school[a]						
Regular high school/Anatolian High School	894	91.6	15.91±5.94	87.97±15.97	20.47±3.87	67.50±12.67
Vocational School of Health	82	8.4	15.57±5.85	91.69±14.68	21.51±3.17	70.18±12.11
Z			-0.295	-2.555	-2.751	-2.302
p			0.768	**0.011**	**0.006**	**0.021**
Class year[b]						
1	280	28.7	15.57±5.54	84.27±15.74	20.00±4.20	64.27±12.19
2	262	26.8	16.27±6.15	88.57±16.08	20.50±3.72	68.07±12.85
3	232	23.8	15.35±6.42	88.91±16.79	20.61±3.93	68.30±13.47
4	202	20.7	15.93±5.83	94.06±10.71	21.52±2.59	72.54±8.72
X^2			3.961	66.575	16.802	76.590
p			0.266	**0.000**	**0.001**	**0.000**
Whether to choose the profession voluntarily or not[a]						
Yes	709	72.6	15.67± 5.94	89.90±15.09	20.75±3.61	69.14±12.05
No	267	27.4	16.07±6.08	84.99±16.25	20.17±4.07	64.82±12.77
Z			-0.888	-5.498	-1.988	-5.996
p			0.375	**0.000**	**0.047**	**0.000**
Reason for choosing the profession						
Because it has a job guarantee	313	49.3	15.87±6.40	92.26±14.95	21.12±3.51	71.14±12.08
Because he/she loves nursing	481	32.1	15.95±5.83	86.73±15.38	20.35±3.82	66.38±12.12
Because her/his score is enough for the nursing	101	10.3	15.51±5.12	89.54±13.14	20.88±3.35	68.66±10.44
Because his/her family wants	68	7.0	15.22±6.29	84.44±18.04	19.57±4.31	64.86±14.19
Because it pays well	13	1.3	12.53±5.41	80.76±22.07	20.07±5.20	60.69±17.25
X^2			6.049	54.737	17.095	62.411
p			0.196	**0.000**	**0.002**	**0.000**
Post-graduation career plan[b,#]						
Becoming a clinical nurse	487	49.9	15.66±5.85	87.94±15.98	20.51±3.81	67.42±12.78
Becoming an academician	300	30.7	15.92±5.75	90.67±12.70	20.97±3.18	69.70±10.19
Becoming an executive nurse	117	12.0	16.00±6.51	90.40±13.84	20.99±3.29	69.41±11.12
Not to do nursing	32	3.3	14.87±8.22	76.56±20.38	18.12±5.12	58.43±15.69
Becoming a training nurse	28	2.9	16.42±4.83	80.21±26.44	18.71±6.32	61.50±20.45
Being a teacher in a vocational school of health	12	1.2	16.08±7.85	94.33±8.68	21.58±3.26	72.75±5.83
X^2			3.427	21.878	13.458	22.580
p			0.489	**0.000**	**0.009**	**0.000**
Presence of a Nurse Relative in the Family						
Yes	372	38.1	15.45±5.65	89.85±13.58	20.83±3.39	69.02±10.85
No	674	61.9	15.99±6.18	87.76±16.62	20.45±3.95	67.30±13.22
Z			-0.785	-0.981	-0.851	-1.022
p			0.432	0.326	0.395	0.307
Mean Age: 20.38±1.62 years						

a Mann-Whitney U, b Kruskal-Wallis
#More than one option was marked.

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Table 2. Students' Views and Experiences on COVID-19 Infection (n=976)

Student Experiences on COVID-19	n	%	Fear of COVID-19 Scale Total Score Mean±SD	NPPS Total Score Mean±SD	Professional Status Mean±SD	Professional Qualifications Mean±SD
Infected with COVID-19[a]						
Yes	144	14.8	16.09±6.06	87.72±15.47	20.37±3.67	67.34±12.20
No	832	85.2	15.73±5.97	88.70±15.58	20.63±3.77	68.06±12.43
Z			-0.735	-1.043	-1.205	-1.025
p			0.462	0.297	0.228	0.305
Family member(s) with infected COVID-19[a]						
Yes	620	63.5	15.86±5.82	87.05±16.83	20.31±4.10	66.73±13.20
No	356	36.5	15.74±6.08	89.42±14.73	20.75±3.53	68.66±11.86
Z			-0.421	-2.481	-1.368	-2641
p			0.674	**0.013**	0.171	**0.008**
Loss of a relative due to COVID-19 infection[a]						
Yes	92	9.4	16.32±6.41	90.55±14.18	21.02±3.19	69.53±11.66
No	884	90.6	15.73±5.94	88.35±15.69	20.55±3.80	67.80±12.46
Z			-0.684	-1.361	-0.980	-1.345
p			0.494	0.174	0.327	0.179
Student Views on COVID-19						
Impact of the COVID-19 pandemic on the nursing profession[b]						
Negatively affected	363	37.2	16.69±5.60	87.30±17.19	20.55±4.16	66.74±13.53
Positively affected	308	31.6	15.77±6.31	91.00±14.64	20.96±3.50	70.03±11.76
Not affected	305	31.3	14.71±5.91	87.59±14.12	20.27±3.46	67.31±11.33
X^2			21.991	17.780	12.566	18.118
p			**0.000**	**0.000**	**0.002**	**0.000**
The effects of the COVID-19 pandemic on the image of nursing in society[b]						
Negatively affected	124	12.7	16.61±6.93	80.11±20.52	19.03±5.06	61.08±16.12
Positively affected	759	77.8	15.75±5.82	90.18±14.24	20.90±3.43	69.28±11.39
Not affected	93	9.5	14.92±5.82	86.53±14.52	20.17±3.69	66.36±11.44
X^2			3.560	37.003	15.516	38.619
p			0.169	**0.000**	**0.000**	**0.000**
Willingness to choose the nursing profession after the COVID-19 pandemic[b]						
Yes	415	42.5	15.72±6.07	90.43±16.25	20.76±3.89	69.66±12.87
No	242	24.8	16.05±6.29	84.11±15.75	20.07±3.84	64.04±12.63
Undecided	319	32.7	15.65±5.63	89.49±13.80	20.77±3.47	68.71±10.88
X^2			0.550	49.183	10.462	53.939
p			0.760	**0.000**	**0.005**	**0.000**
Intention to leave nursing education due to COVID-19[a]						
Yes	86	8.8	17.84±6.64	82.26±19.35	19.32±5.02	62.94±14.75
No	890	91.2	15.58±5.88	89.16±15.02	20.72±3.58	68.44±12.04
Z			-3.226	-3.600	-2.045	-3.938
p			**0.001**	**0.000**	**0.041**	**0.000**

a Mann-Whitney U, b Kruskal-Wallis

Table 3. Descriptive Statistics and Indicators Related to Scales

	Fear of COVID-19 Scale	NPPS	NPSS Sub-dimensions	
			Professional Status	Professional Qualifications
n	976	976	976	976
Number of scale items	7	22	5	17
Minimum-maximum	7-35	22-110	5-25	17-85
Mean±SD	15.78±5.98	88.56±15.56	20.59±3.75	67.96±12.39
Cronbach's alpha coefficient	0.87	0.93	0.80	0.94
Skewness±SD	0.559±0.07	-2.007±0.07	-1.879±0.07	-1.824±0.07
Kurtosis±SD	0.209±0.15	5.556±0.15	4.888±0.15	4.722±0.15

Table 4. Compatibility of the Fear of COVID-19 Scale and Nursing Profession Perception Scales

	NPPS Sub-dimensions					
	Professional Qualifications		Professional Status		NPPS Total Score	
	r	p	r	p	r	p
Fear of COVID-19 Scale	0.077	**0.016**	0.075	**0.020**	0.084	**0.019**

DISCUSSION

In this study, which was conducted during the pandemic, the COVID-19 fear levels of nursing students were moderate, and their perceptions of the nursing profession were positive (Table 3). The level of fear of COVID-19 in nursing students differs according to the country. In studies conducted in Mexico (15), the Philippines (28), Malawi (29), Norway (30), Spain (31), and Saudi Arabia (32), nursing students' fear levels of COVID-19 were high. The findings in the studies conducted in Turkey (18,33) are consistent with this study, students' COVID-19 fear level was at a medium level. Concerning the studies that have examined attitudes across different groups of students, the findings suggest that nursing students expressed greater fear (34,35). In the study of Lovric et al. (2020), students stated that they became aware of their responsibilities to society, and the importance and risks of the nursing profession during the COVID-19 pandemic (36). In a study in Spain that compared health workers and nursing students, 52.8% of healthcare workers said they would be willing to work longer hours in the event of an influenza pandemic than 69.1% of nursing students (37). In the studies conducted with nursing students during the pandemic period in Turkey, the professional perception is positive (24,38). While the literature supports that the pandemic is effective on professional perception, to our knowledge, no study examining the relationship between professional perception and fear of COVID-19 was present. According to this study, there is a positive but very weak relationship between fear of COVID-19 and professional perception. The weak correlation between the two scales suggests that different factors related to the fear of COVID-19, such as depression, anxiety, and stress, impact occupational perception, too. In addition, the COVID-19 fear levels of the students participating in the present study are at a moderate level. The feeling of fear is a strong emotion that affects perception, and as the level of fear increases, there are perceptual changes. Caliskan et al. (2021) emphasized that as the fear of COVID-19 increased, the positive attitude toward the nursing profession decreased (18). Dost et al. (2021) found that the level of professional image perception of intern nurses who stated that they felt fear and anxiety was lower than the others (17). Since professional image perception is the whole of nurses' perceptions, views, and attitudes toward their profession, Dost et al. (2021) support our study results.

In our study, the sex factor affected both fears of COVID-19 and professional perception. This study shows that the fear of COVID-19 and the level of professional perception were high in female nursing students. Similarly, in studies conducted in Saudi Arabia and Turkey, the fear level of female nursing students for COVID-19 was higher (18,32,33). In addition, our study shows that students living in urban areas have lower COVID-19 fear levels than those living in rural areas. In other words, social and personal measures are more strictly controlled due to the population density in cities, and access to health services is easier. Moreover, the elderly population is at higher risk and mostly lives in rural areas.

For nursing students, perception of the profession defines how students feel, think about themselves, their environment, the appropriateness of nursing and nursing actions, and consider nursing education. It is crucial to have a positive perception and attitude towards that profession in adapting to the profession and maintaining a productive working life (39). In our study, the professional perceptions of senior students and students who graduated from the vocational school of health and chose the profession voluntarily were positive, but there was no significant change in their fear of COVID-19 (Table 1). This result suggests a two-way interaction between fear of COVID-19 and professional perception and that professional perception can also affect the level of fear. In the literature, being in the upper class and choosing the profession willingly improves professional perception (20,24). Students who like nursing inevitably will have more positive professional perceptions since they will more easily acquire the values and skills that include professional qualifications than those who do not. However, to our knowledge, no study examined the relationship between fear of COVID-19, class, and liking the profession.

In our study, the professional perceptions of students who did not have a family history of COVID-19 infection increased positively. However, according to the findings, having COVID-19 does not affect their professional perceptions ($p>0.05$). This suggests that students are more concerned about their family members rather than themselves. In addition, the reason why the infection has not been seen in the family members of the students might be because of the knowledge they had acquired during their nursing education, such as hand hygiene, protection from infectious diseases, and also being responsible.

Study Limitations: Since this current study was at only one nursing school, these findings cannot be generalized. In this study, the relationship was examined only between the level of fear of COVID-19 and the perception of the nursing profession. The effects of other factors, such as depression, anxiety, and stress related to COVID-19 on the nursing profession perception, have not been evaluated.

CONCLUSION

The findings obtained in our study show that fear of COVID-19 affects professional perception in nursing students weakly; however, there is a two-way relationship between professional perception and fear of COVID-19. In this respect, teaching methods of coping with fear during nursing education may affect professional perception positively. Additionally, a training curriculum that will improve professional perception may mitigate the fear during similar pandemic periods.

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MSD

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Evaluation of coronary arteries stenosis by computed tomography angiography in district Faisalabad

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ABSTRACT

Objective: This study was conducted to investigate the accuracy and precision of computed tomography angiography for assessing significant coronary artery stenosis in district Faisalabad.

Materials and Methods: The data was collected from the Radiology department of Shifa International hospital Faisalabad. Sixty patients (40-80 years of age) were assessed through computed tomography to evaluate coronary heart disease. Data was collected by using a close-ended self-modified questionnaire and analyzed by SPSS V22.

Results: The findings of this study showed that the incidence of coronary heart disease patients was 34 (56.67%) out of 60. Among the affected patients, 39 (65%) were male, and 21 (35%) were female. Based on the evaluation, most of the affected patients were under (50-60) years of age. The percentage of coronary arteries stenosis varies as the left anterior-descending artery LAD had higher stenosis (41.67%) among others; left main LM (16.67%), left-circumflex artery LCX (20%), and right-coronary artery RCA (21.67%) in all affected patients.

Conclusion: It was presumed that computed tomography angiography precisely distinguishes the presence and finding of coronary stenosis and was additionally pronounced the best quality level. Based on coronary arteries, stenosis of LAD was the most commonly reported in diseased patients. Other arteries stenosis can also increase the risk of CHD in patients.

Keywords: Coronary heart diseases, Coronary artery stenosis, Computed tomography angiography, Left anterior descending artery, Acute coronary syndrome

INTRODUCTION

Coronary heart disease: Coronary heart disease is one of the grave health issues in our society (1). In the United States, CHD is the leading cause of death and about a third of all deaths among persons over the age of 35. Mortality from CHD was expected to continue to rise in the developing world (2). For coronary artery disease imaging, Computed Tomography Angiography (CTA) has been the first and most progressive application (3).

Coronary heart disease is regarded as the result of occlusive vessels due to lipid deposition, while an increase in plasma cholesterol became the risk factor (4). The prevalence of CHD in developed countries among the elderly (29-59) declined from 42% to 32% among men and from 29% to 16% among women, while no change from age 60 or older, however, with a decrease in the incidence of coronary artery disease (2). For diagnosis, the CT acquisition modality is advantageous for CHD assessment, including myocardial viability, myocardial perfusion, coronary angiography, and ventricular function assessment (5).

Atherosclerosis plaques result in acute coronary syndrome (ACS) that leads from mild coronary stenosis to adverse cardiovascular events (6). In asymptomatic patients, myocardial infarction is the first clinical presentation of coronary heart disease and leads to myocardial necrosis which is caused by unstable ischemic syndrome (7, 8). The disruption of plaques as a solid state produces thrombosis that persuades ACS (14, 15).

Coronary stenosis is the narrowing of the arteries, and the study is meaningful for the progression of coronary artery disease (9). The commonness of coronary conduit stenosis is around 5% in patients with constant angina, around 7% in patients with intense myocardial dead tissue (AMI), and around 9% in patients with sidestepping a medical procedure (10). Multi-slice computed tomography, coronary angiography is an excellent approach to safe coronary angiography for finding and evaluating coronary stenosis (11). Coronary CT Angiography is important for detecting coronary stenosis and plaque (1).

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The risk of lifelong coronary heart disease is 1/3 for women and 1/2 for men at all ages (12). Overall, 23% of patients undergo angiography, and 6% of patients who have had a myocardial infarction do not know the cause of CAD (13). In recent decades, the pathophysiology of CAD has developed exceptionally well. Patients generally typically show up with acute or chronic exemplification (7).

For diagnosis, CT coronary angiography continues to provide the highest level of accuracy for locating a coronary disease (16). The coronary computed tomography angiography (CTA) technique is a reliable, safe, and symptomatic tool for evaluating individuals with coronary conduit illness (17).

CT Coronary Angiography: It appears that CTA is a fascinating, risk-free, and excellent first-line imaging technique with the potential to obtain all measurements (18). Due to its diagnostic performance being comparable to catheter coronary angiography for individuals with CAD, coronary computed tomography angiography has recently attracted much interest (19). Every year, roughly 2.3 million coronary CT Angiography inspections and one million CT examinations are performed (18).

The majority of studies show clear condescending for cardiac CT angiography (CCTA). Regarding obstructive coronary artery disease identification, CCTA got greater approval for use in ordinary clinical practice (17). CCTA has predictive value for both all-cause mortality and critically important cardiovascular events, according to single-center studies (20, 37).

High specificity and sensitivity (greater than 90%) have been achieved with 64-slice CT for CABG, and coronary CTA also plays a vital role in the evaluation of the patency or occlusive alterations of coronary artery bypass grafts (CABG) for the diagnosis of severe stenosis (21).

Multi-slice CT's improved temporal and spatial resolution has improved the imaging of tiny structures (22). Due to the high motion velocity of the coronary arteries, the coronary CTA scanner has a greater temporal resolution (19-75 ms) to produce images of the beating heart with the least amount of motion artifact (23). However, the most recent 64-slice scanners have superior image quality (better spatial and temporal resolution) having good diagnostic validity (24, 25).

In contrast to IVUS, which has limitations, MSCT is a reliable and accurate test. Multislice computed tomography enables non-invasive evaluation of the vascular wall following contrast administration (11). MSCT has developed as a painless alternative for the assessment of coronary plaques as a result of advancements in imaging techniques. In any event, MSCT has several advantages in the diagnosis and treatment of coronary vein plaques (27).

Rationale: The rationale of our study is that limited research was conducted about the application of computed tomographic angiography to evaluate coronary heart disease in Pakistan.

MATERIAL and METHODS

Study group: A descriptive study was performed on 60 patients (39 males and 21 females) having coronary heart disease in the age group between 40 years to eighty years. In this study male to female proportion was 1:8:1.

Study design and setting: A cross-sectional study was conducted in Shifa International Hospital, Faisalabad, Pakistan, by a TOSHIBA 64-slice helical CT machine.

Data collection and analysis: Data was collected by using closed-ended self-modified performa and analyzed by using a statistical package for social science (SPSS) version 22.

Ethical issues: This study had no ethical issues because the client was not put on the experiment and no medication was given during the study. Moreover, the study was duly approved by the ethical committee of Faisal hospital, Faisalabad.

RESULTS

Sixty patients with coronary heart disease, 39 (65%) were male, and 21 (35%) were female (**Figure. 1**).

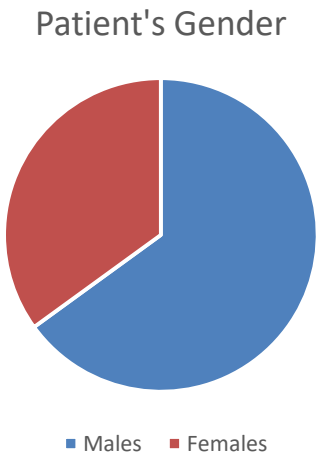

Figure 1: Distribution of Patient's Gender

Patients were categorized into four age groups; patients under 40-50 years of age were 18.33%, 50-60 years of age group about 43.33% patients, followed by 60-70 years of age group 26.67%, lastly, 70-80 years of age group patients were 11.67% (**Figure. 2**).

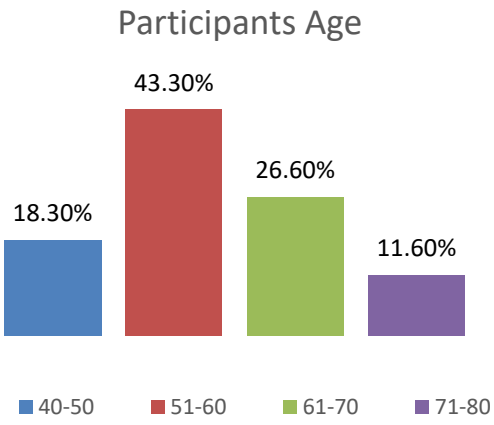

Figure 2: Frequency distribution of participant's age

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Sixty consecutive patients with coronary illness were examined, and coronary heart diseases were found in 34 (56.6%) patients (**Figure. 3**).

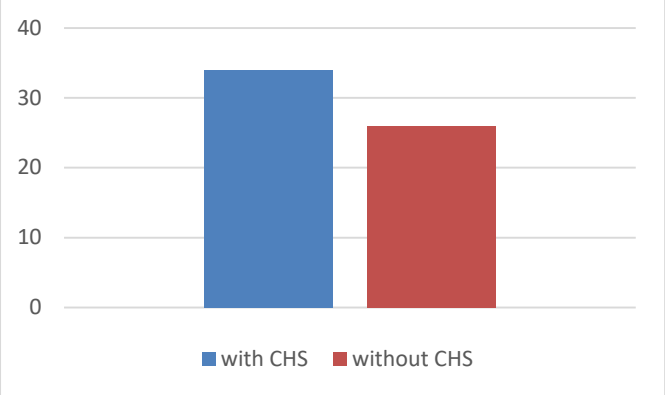

Figure 3: Distribution of patients with and without coronary heart stenosis

The stenotic coronary arteries found in our patients vary as the left anterior-descending artery LAD was 14 (41.67%), the most stenotic artery among all arteries. However, left main LM was found in 5 (16.67%) patients, left circumflex-artery LCX was found in 7 (20%) patients, and right-coronary artery RCA was found in 8 (21.67%) patients among all affected patients (**Figure. 4**).

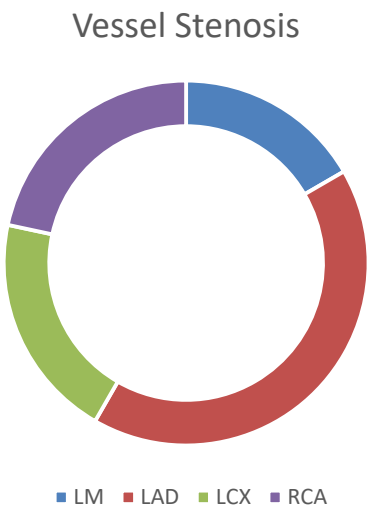

Figure 4: Coronary Vessel based analysis for stenosis by CTA

A bar chart shows calcified arteries based on calcium scoring in our coronary heart disease patients. Left main artery calcification was found in 5 (16.67%) patients, left anterior descending artery calcification was in 15 (46%) patients, left circumflex artery was in 8 (23.33%) and the right coronary artery was in 7 (20%) patients. The percentage and frequency of calcification were highest in LAD among all arteries of affected patients noted in each patient Performa (**Figure. 5**).

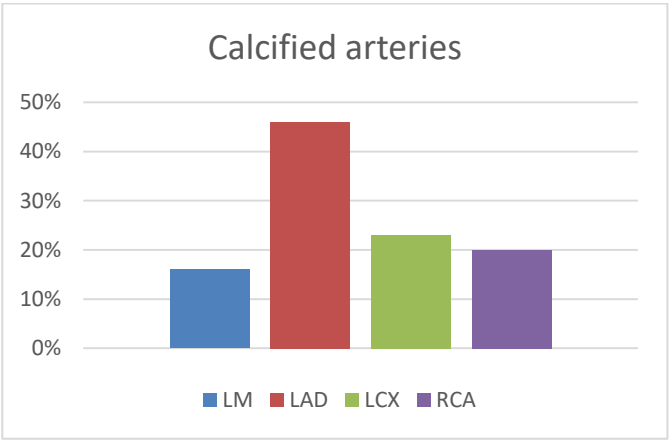

Figure 5: Calcified arteries on the basis of calcium scoring

DISCUSSION

Sixty cases were interviewed using a self-modified questionnaire or Performa. The high frequency of coronary heart disease is notable and numerous different creators have distributed research on the commonness of coronary illness and the symptomatic and diagnostic capacity of computed tomography angiography (CTA).

The estimation of the incidence of coronary heart disease in this study is quite comparable with the results of earlier and larger studies by Sebastian Leschka and his co-workers in 2005 on 67 patients; 50 male and 17 female, and observed that 47 (70%) patients were distinguished as having huge coronary artery stenosis (39).

G. Mowatt conducted a meta-analysis on coronary artery disease evaluation in 2008. According to this study's findings, 64-slice CT is extremely sensitive for diagnosing patients' substantial chest discomfort and coronary artery disease, especially when the diagnosis is unclear (16). Our survey results with 64-slice CT were quite similar to this study.

The results of our study are also closely consistent with the larger study performed by Armin Arbab Zadeh and his colleagues in 2012 on 371 consecutive patients. The consequences of their study demonstrated that 98 (28%) patients had a high frequency of coronary artery disease, while our study showed coronary heart disease in 34 (56%) patients (33).

W. Bob Meijboom and his co-workers (2008) did a prospective study on 360 symptomatic patients between 50-70 years of age. Their study reported the predominance of coronary artery illness at 68% (38). The results of our survey were quite similar to this study.

The results of our study are also closely related to an ancient and bigger study conducted by Julie M. Miller in 2008 on 291 patients. The aftereffects of their study showed that 56% of patients had the obstructive coronary-artery disease (35).

CONCLUSION

It was concluded that coronary heart disease was found in 34 (56.67%) out of 60 patients, and computed tomography angiography precisely distinguishes the presence and analysis of coronary illness and was additionally pronounced the best quality level. Based on coronary arteries, stenosis of LAD was the most commonly reported in diseased patients. Other arteries stenosis can also increase the risk of CHD in patients.

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Author Contributions: AMK, WH: Study design, Literature review, Data collection and processing, **AMK:** Writing, Revisions

Ethical approval: All procedures performed in studies involving human participants were in accordance with the institutional and/or national research committee's ethical standards and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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Measuring fall risk in patients hospitalized in palliative care services and factors affecting nutritional risk

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ABSTRACT

Objective: The study was conducted to determine the fall risk of patients hospitalized in the palliative care services of state hospitals affiliated to Bursa health directorate and to determine the differences between the groups with and without malnutrition risk.

Method: The sample of the study, which was planned as a descriptive study, consisted of consecutive (n=573) patients over 65 years of age who were hospitalized in the palliative care services of public hospitals affiliated to Bursa Health Directorate in the first six months of 2022. The Itaki Fall Risk Scale (19 questions), which will be used to determine the study data, socio-demographic and clinical data of patients (13 questions), fall risk and fall event (13 questions), and fall risk score (for patients aged 17 and over), Nutritional risk collected using the test. Statistical analysis of the data obtained was done using the frequency and percentage, chi-square test in SPSS for Windows 18.0 program.

Results: The number of hospitalized patients during the time we worked in palliative care services was 752. Of these, 573 people over the age of 65 were included in our study. The median age of the group aged 65-100 years is 80. 53.2% were female, 46.8% were male. 92% of them had at least one chronic disease. The three most common chronic diseases were HT, Alzheimer's and Cerebrovascular Disease, respectively. A statistically significant difference was observed in the scoring of COPD, Alzheimer's and pressure ulcers in the groups with and without nutritional risk, respectively.($p<0.001$, $p<0.001$, $p<0.001$)

Conclusion: Malnutrition, falls, and bedsores can be prevented early in patients screened with appropriate scales. In this way, it may be possible to prevent the burden of disease on the caregiver, the society, and the state.

Keywwords: palliative care , risk factors , falls , malnutrition , chronic disease

INTRODUCTION

Life expectancy at birth increased from 71 to 78.3 between 1990 and 2019. It is predicted that the expected life expectancy will be 77.1 in 2050 (1). In the 2022 Population Expectations report, the share of the population over the age of 65 in the total population is 10%, and it is expected to be 16% in the 2050 projection. The increase in the elderly population is associated with a lower death rate and higher survival (2). According to the Turkish Statistical Institute (TUIK) projections, the proportion of the elderly (over 65 years old) population, which was 7.5% in 2012, was 10.2% in 2023, 12.9% in 2030, 16.3% in 2040, and % in 2060. It is estimated to be 22.6 and 25.6% in 2080 (3, 4). Life expectancy is increasing in Turkey, as expected in the world.

Although the total energy needs decreases with age, the need for many types of nutrients does not change. Malnutrition observed in the elderly causes a decrease in muscle and bone mass, and this decrease causes an increase in bone fractures. Moreover, malnutrition causes a decrease in cognitive functions, which limits the self-sufficiency capacity of the elderly (5). While 600 million elderly people were living in the world in 2002, this number is expected to double in 2025, and since 70% of this is expected to live in underdeveloped and developing countries, malnutrition will be encountered frequently in the coming years (6). Malnutrition, such as dementia, falls, and incontinence, which are common in the elderly population, are among the important problems seen in this group (7).

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In different studies, malnutrition rates have been found to reach 50% among elderly individuals (8). In a meta-analysis on the prevalence of malnutrition, 3.1% in the community, 6% in outpatients, 8.7% in home care services, 17.5% in nursing homes, 22% among hospitalized patients, 28.7% in long-term care patients, 29.4% in rehabilitation services. has been reported (9). In a study conducted with 6450 individuals over 60 years of age in China, the prevalence of malnutrition was reported to be 12.6% (10). In a study involving 3299 elderly individuals, 75% of whom were taken from individuals living in a nursing home and 25% from individuals living in the community in Belgium, it was reported that this rate was 68% among those living in the community and 82% among those living in a nursing home (11). In a study in which patients followed in the geriatric clinic of Istanbul University were screened in our country, the malnutrition rate was found to be 13% and the risk of malnutrition to be 31% (12). It was reported that the rate of malnutrition was 9.8% and the risk of malnutrition was 22.8% in the screening conducted in 2009 and 2010 in nursing homes in the province of Istanbul (13).

The incidence of other geriatric syndromes, such as depression, dementia, loss of cognitive function, stool incontinence, and increased physical dependence in the elderly with malnutrition is also increasing (12). Malnutrition increases morbidity and mortality in acute and chronic diseases at all ages, complicates post-traumatic recovery, causes serious complications, prolongs hospital stays, and increases treatment bills (14). In a study conducted with 827 individuals over the age of 70, it was concluded that the annual health expenditure of individuals with malnutrition is 714 Euros more than those without malnutrition (15).

Falls affect one in three adults over 65 (16) and one in two adults over 80 (17) each year. Nearly 30% of these affected individuals are severely injured that require hospitalization (18). In 2009, 2.2 million non-fatal falls were admitted to emergency services among older adults in the USA, and more than 19,000 older adults died from unintentional falls in the same year, making falls the 5th most common cause of death in adults over 65 years of age (19). Falls are common events that negatively affect patient safety in hospitals. Post-fall injury, pain, orthopedic complications, tissue and organ loss, decrease in function, as well as anxiety in patients, relatives and hospital staff. These consequences caused by falls make it important to determine the causes of falls and to take measures to prevent them (20). Malnutrition and risk of falling, which cause prolonged hospitalizations, repeated hospitalizations, a decrease in quality of life, strain on caregivers, and an increase in care costs, should be identified in elderly patients as early as possible. This study was carried out to determine the fall risk of patients hospitalized in the palliative care services of state hospitals affiliated to Bursa Health Directorate and to determine the differences between the groups with and without malnutrition risk.

MATERIAL and METHODs

This study was planned as a descriptive study to evaluate the relationship between malnutrition and fall risk and other risk factors in geriatric patients. Seven hundred fifty consecutive patients hospitalized between January and June 2022 in 12 state hospitals in Bursa were included in the study. The study was completed with 573 patients who compensated the specified criteria. Personal information form, İtaki Fall Risk Scale, Mini Nutritional Assessment Test were applied to the elderly. The applications were made face-to-face.

Data Collection Tools: Mini Nutritional Assessment Test: NRS-2002 "Nutritional Risk Screening" is a method that is frequently used in determining the nutritional status of the elderly. NRS-2002 Kondrup et al. It was developed by in 2002 (21). The development of NRS-2002 was done with a different method compared to the development of other scanning tools. The study group created a screening system by examining 128 randomized controlled trials. The screening tool was created with the participation of the Danish Parenteral and Enteral Nutrition community and the researchers (22). The scoring system consists of two parts as 'nutritional status' and rity' and provides s'disease seve coring as 'no problem', 'mild', 'moderate' and 'severe'. Scoring is made between 0-3 for each section. In addition to scoring in patients over 70 years of age, 1 more point is added to the score due to age. Patients with a total score of ≥3 are considered to be at nutritional risk.

İtaki Fall Risk Scale: It is a measurement tool organized by the Ministry of Health of the Republic of Turkey for Turkish society and named after Şemseddin İtaki, one of the leading physicians of the 17th century (23). It is the form applied in clinics in accordance with the quality standards in health, which is used to determine the measures to be taken to prevent falls according to the risk factors present in the patient. Sixty-five years and older; Consciousness, chronic disease history, need for physical support while walking, vision status, drug use, dizziness, orthostatic hypotension, whether there is a physical disability, any equipment connected to the patient, and risky drug use are evaluated. Evaluation, 1. Initial evaluation 2. Post-operative period 3. It is repeated when the patient falls 4. Department change and 5. Status change. The test takes about 5 minutes. It consists of 19 questions, including minor risk factors and major risk factors. A total score of 5 and above is defined as high risk (24).

Statistical analysis: The conformity of the data to the normal distribution was evaluated with the Shapiro Wilk test. Since none of the continuous variables showed a normal distribution, the descriptive features were given as the median (minimum-maximum). For categorical variables, descriptive features were shown as percentage and frequency. In the comparison of two groups between patients with and without nutritional risk, Independent Student's t test was used for continuous variables and Chi-square or Fisher's Exact test was used for categorical variables. THE IBM SPSS Statistics Version 22.0 program was used to evaluate the research data. A p value of <0.05 was considered statistically significant.

Ethic: Application permission was obtained from the institution where the study would be conducted, and Bursa City Hospital Non-Invasive Clinical Research Ethics Committee approval (2022/84). Participants were informed about the research and their verbal consent was obtained. The forms were made in a room where the participants could express themselves comfortably. The results obtained were considered only as research findings and kept confidential, paying attention to the privacy of the participants and the confidentiality of personal information.

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RESULTS

The number of hospitalized patients during the time we worked in palliative care services was 752. Of these, 573 people over the age of 65 were included in our study. The median age of the group aged 65-100 years was 80. 53.2% were female, 46.8% were male. 92% of them had at least one chronic disease.

The three most common chronic diseases were HT with 44.9%, Alzheimer's with 33.5% and Cerebrovascular Disease with 22.7%, respectively. The ittaki risk scale, nutrition test, pressure ulcer scores, and sociodemographic data applied to the patients are shown in **Table 1**. A statistically significant difference was observed in the scoring of COPD, SVO, DM, Alzheimer's, and pressure sores in the groups with and without nutritional risk, respectively. (p<0.001, p<0.001, p=0.028 , p=0.047, p<0.001)(**Table2)**

Table 1. Demographic properties of participants

Age	80 (65-100)
Gender	
- **Female**	305 (%53.2)
- **Male**	268 (%46.8)
Having chronic disease	528 (%92.1)
Comorbidity	
- **Alzheimer's disease**	192 (%33.5)
- **Parkinson disease**	24 (%4.2)
- **Cerebrovascular disease**	130 (%22.7)
- **Diabetes mellitus**	121 (%21.1)
- **Hypertension**	257 (%44.9)
- **Chronic Kidney Disease**	10 (%1.7)
- **Chronic Obstructive Pulmonary Disease**	53 (%9.2)
- **Cardiovascular Disease**	92 (%16.1)
- **Cancer**	117 (%20.4)
- **Other**	4 (%0.7)
İtaki score	15 (3-32)
NRS 2002	3 (0-6)
Pressure sore score	12 (0-24)
Nutritional risk	375 (%65.4)
Risk of fall	570 (%99.5)
Pressure sore risk	573 (%100)

Table 2. Effects of nutrition status on parameters

	With Nutritional risk (n=375)	Without Nutritional risk (n=198)	p
Age	80 (65-100)	80 (65-99)	0,602
Gender			
- **Female**	198 (%52,8)	107 (%54)	0,777
- **Male**	177 (%47,2)	91 (%46)	
Having chronic disease	344 (%91,7)	184 (%92,9)	0,613
Alzheimer's disease	115 (%30,7)	75 (%38,9)	0,047
Parkinson disease	15 (%4)	9 (%4,5)	0,757
Cerebrovascular disease	105 (%28)	25 (%12,6)	<0,001
Diabetes Mellitus	69 (%18,4)	52 (%26,3)	0,028
Hypertension	165 (%44)	92 (%46,5)	0,573
Chronic Kidney Disease	7 (%1,9)	3 (%1,5)	1,000
Chronic Obstructive Pulmonary Disease	23 (%6,1)	30 (%15,2)	<0,001
Cardiovascular Disease	55 (%14,7)	37 (%18,7)	0,213
Cancer	81 (%21,6)	36 (%18,2)	0,334
İtaki score	15 (3-32)	15,5 (3-29)	0,435
Pressure söre score	12 (0-20)	13 (0-24)	<0,001
Risk of fall	373 (%99,5)	197 (%99,5)	1,000

DISCUSSION

The prevalence of malnutrition has been reported to vary between 20% and 50%, and this range is thought to be high due to differences in the method used for malnutrition detection and in the hospital environment (14). The largest portion of epidemiological evidence for prevalence comes from Europe in the range of 20-30% (25, 26). In studies conducted in Asia, the prevalence was reported to be between 27% and 39% (27, 28). The difference in the prevalence reported in Europe and Asia may be due to the improved medical facilities in Europe compared to Asia and the use of early diagnosis options. In a study on 413 patients who applied to the internal medicine outpatient clinic in Turkey, the malnutrition rate was found to be 13% and the risk of malnutrition to be 31% (12). The malnutrition risk in our study was 65.4%, which was found above the literature of our country and the world. This may be because 92% of our study group had a chronic disease, and we only recruited patients over the age of 65 and performed them in an inpatient service instead of an outpatient clinic.

In our study, it was found that age and malnutrition risk were not statistically correlated. In the literature, it has been reported that the prevalence of malnutrition increases between 32% and 58% with increasing age(29-31). The decrease in cognitive functions, decrease in the need for food, hormonal weak response, and decrease in the energy need in the aging individual may be effective in the increase in the risk of malnutrition with age, and the disruption of the release of hormones by stimulating the feeling of hunger may be effective. The difference between our study and the literature may be that our entire population is over 65 years old.

In this study, it was observed that 52.8% of the patients with malnutrition and 47.2% of the patients at risk of malnutrition were women. In the literature, the results of the investigation of the relationship between malnutrition and gender were found to be different from each other. Another study reported that the group with malnutrition and a high risk of malnutrition is men (32). In another study, it was reported that the risk of malnutrition was higher in women (33).

Chronic diseases are very common in the elderly population, and chronic diseases can disrupt the individual's diet. Our study found that 91.7% of those with malnutrition risk had at least one chronic disease. The literature also reports that the presence of at least one chronic disease is a risk factor for malnutrition (34, 35). The fact that chronic diseases are risk factors for malnutrition may be due to the increase in the prevalence of chronic diseases with age, and the deterioration of hunger and satiety balance due to polypharmacy. Our study found that chronic diseases such as COPD, Alzheimer's, DM, SVO are associated with the risk of malnutrition.

One-third of individuals over the age of 65, who constitute one-third of the society, fall every year(36). Although similar rates of falls are observed in men and women in advancing ages, women tend to decrease more often than men in the early stages of old age (37). The prevalence of falls is one in four elderly people aged 70 years and one in three elderly over 75 years of age each year (36). It has been shown in the literature that age progression is associated with falling (36, 38). A study conducted in our country reported that the risk of falling scale increases with age. In our study, the risk of falling was determined in all our patients over the age of 65 who were hospitalized in palliative care. Again, in the same study, it was shown that there is a negative correlation between mean age and malnutrition screening score. Again, among individuals who applied to internal medicine outpatient clinics in our country, 44.7% of those with malnutrition were found to have balance problems. Another study reported that falling was associated with the risk of malnutrition (39). This relationship can be explained by the balance between the increase in the prevalence of falls with aging and the increase in the risk of malnutrition and the incidence of chronic diseases with aging.

CONCLUSION

Palliative services, which are also closely related to family medicine specialists and have great efforts in their establishment, are not only places to be with people on their death journey, but also places where chronic diseases are taken care of and patient relatives are trained. The importance of both family physicians with a holistic approach and palliative services will increase with the aging society, extended life expectancy and the increase in individuals with chronic diseases. Malnutrition, falls and pressure sore can be prevented early in patients screened with appropriate scales. In this way, it may be possible to prevent the burden of disease on the caregiver, the society, and the state.

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Use of Ocudox™ or hypochlorous acid to inactivate SARS-CoV-2 as an alternative to alcohol-based products

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ABSTRACT

Objective: The main route of entry of SARS-CoV-2 which responsible of COVID-19 is through the nasal, oral, or conjunctival mucosa and droplets or aerosols transmit the virus. Even if transmission through fomites is considered unlikely, hand hygiene is important to minimize this and other infections, especially in certain scenarios as healthcare facilities and crowded places as public transport or social events.

Material and methods: In this study, we assess and compare the virucidal efficacy of HOCl solutions against SARS-CoV-2 at different time-points. a nasopharyngeal swab collected from an 89-year-old male patient during March 2020 in Catalonia, Spain (GISEAD ID EPI_ISL_510689). The virus was propagated in Vero E6 cells (ATCC CRL-1586) cultured in Dulbecco's modified Eagle medium (DMEM). A total of 24 plastic plates (35 mm SPL Ref. PLC20035) for the first study, and 12 plates for the second one, were prepared. One day before titration, 96-well plates were prepared with Vero E6 cells. The day of titration, two replicates of five 10-fold serial dilutions of each sample were performed. Plates were incubated at 37°C and 5% CO2 for 7 days, and afterward, SARS-CoV-2-induced cytopathic effect (CPE) was determined under light microscope

Results: The virucidal effect by means of TCID50/mL found after HOCl treatment at different concentrations and times tested. Logarithmic reduction (logR) and the correspondent percentage of inactivation (%) were calculated compared to the untreated controls (desiccated SARS-CoV-2 with water or media). All tested concentrations were able to partially inhibit SARS-CoV-2

Conclusion: Our studies showed that HOCl products represent a valid virucidal alternative to inactivate SARS-CoV-2 potentially present in skin or surfaces.

Keywords: HOCl, SARS-CoV-2, disinfection

INTRODUCTION

The available vaccines reduce the risk of getting COVID-19, and in case of infection, immunization minimizes the symptoms and severity of the disease. However, issues like the emerging variants of concern and the remaining unvaccinated population could hinder the ideal herd immunity. At the beginning of the COVID-19 pandemic, proper hand hygiene was considered a relevant measure to reduce SARS-CoV-2 transmission as other infectious microorganisms, and it is especially important in public places and health care facilities. Nowadays, we know that transmission of SARS-CoV-2 is through respiratory fluids as saliva droplets or aerosols, and rarely through contaminated surfaces. However, transmission through fomites cannot be discarded entirely, and initial recommended alcohol-based products and other antiseptic solutions with virucidal capacity against SARS-CoV-2 might help stop transmission.

Up to now, different disinfectants and detergents have demonstrated their ability to eliminate SARS-CoV-2 from skin and surfaces (1). However, continuous usage of disinfection products may cause skin damage and alteration of the integrity and functions of this natural barrier. Dry skin, irritation, contact dermatitis, and biofilm of pathogenic bacteria can result from overuse of this type of product (2). Hypochlorous acid (HOCl) has been used for more than 100 years for wound treatment and is now frequently used in odontology as disinfectant for oral-maxillofacial surgical practices (3).

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Moreover, it is one of the recommended solutions against SARS-CoV-2 by the US Environmental Protection Agency (4), and at a concentration of 20 ppm, HOCl shows virucidal activity, and concentrations of 50-200 ppm have been described as effective against SARS-CoV-2 (3).

The aim of the present study is to evaluate the virucidal efficacy of a HOCl solution against SARS-CoV-2.

MATERIAL and METHODs

Study design: The experimental designs were adapted from UNE EN14476:2013+A2:2019 norm and performed at the IRTA-CReSA High Biocontainment Unit using the appropriate personal protective equipment (double glove, double gown and Sundström Powered Air Purifying Respirator equipment). SARS-CoV-2 isolate was obtained from a nasopharyngeal swab collected from an 89-year-old male patient during March 2020 in Catalonia, Spain (GISEAD ID EPI_ISL_510689). The virus was propagated in Vero E6 cells (ATCC CRL-1586) cultured in Dulbecco's modified Eagle medium (DMEM), supplemented with 5% fetal calf serum (FCS), 100 U/mL penicillin, 100 µg/mL streptomycin, and 2 mM glutamine. After propagation of the virus, a virus stock was prepared collecting the supernatant. For this study, samples of 100 µL of the virus stock at 106 50% tissue culture infectious dose (TCID50/mL) were desiccated in a period of 90-100 minutes on sterile plastic cell culture dishes (SPL Ref. PLC20035, Labclinics). After, SARS-CoV-2 was exposed to different concentrations of HOCl in two independent experiments. In the first study, 0.005% (50 ppm; Ocudox™) and 0.02% (200 ppm) of HOCl were used, and in the second study, a concentration of 0.01% (100 ppm) was tested. A total of 24 plastic plates (35 mm SPL Ref. PLC20035) for the first study, and 12 plates for the second one, were prepared.

Sample collection: After the exposure time, HOCl was carefully removed and residual virus was gently eluted with 1 mL of media (DMEM, 1% FBS). All samples were stored at -75°C until the virus titration assay.

Sample analysis: One day before titration, 96-well plates were prepared with Vero E6 cells. The day of titration, two replicates of five 10-fold serial dilutions of each sample were performed. Plates were incubated at 37°C and 5% CO2 for 7 days, and afterward, SARS-CoV-2-induced cytopathic effect (CPE) was determined under light microscope.

Data analysis: All replicates for each time point were considered independently. To analyze the differences between treatments and untreated control, Tukey's multiple comparisons test (ANOVA) was used and p-value of less than 0.05 was accepted as statistically significant. Calculations were done using Graphpad Prism 9.

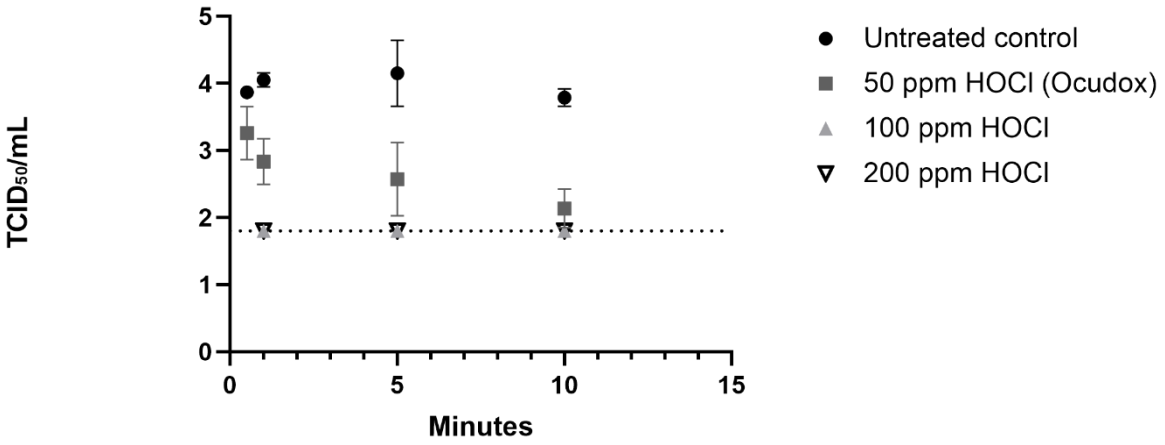
RESULTS

Table 1 shows the virucidal effect by means of TCID50/mL found after HOCl treatment at different concentrations and times tested. Logarithmic reduction (logR) and the correspondent percentage of inactivation (%) were calculated compared to the untreated controls (desiccated SARS-CoV-2 with water or media). All tested concentrations were able to partially inhibit SARS-CoV-2. Concentrations of 100 and 200 ppm were able to inactivate SARS-CoV-2 from 1 minute onwards, below the detection limit of the viral titration technique (1.8 TCID50/mL). Figure 1 shows the residual viral titers detected after HOCl treatment. Differences between all tested concentrations compared to the untreated control were statistically significant (P<0.01).

Table 1: Inactivation results of three different HOCl concentrations under the test conditions of the two studies.

Study	Hypochlorous acid concentration (ppm)	Exposition Time (minutes)	Mean $TCID_{50}$/mL and standard deviation (SD)	LogR	Inactivation (%)
1	Ocudox™ (50)	0.5	3.2 ± 0.4	0.7	80.1
	Ocudox™ (50)	1	2.8 ± 0.4	1.1	92.1
	Ocudox™ (50)	5	2.6 ± 0.6	1.4	96.0
	Ocudox™ (50)	10	2.4 ± 0.2	1.5	96.8
	Hypochlorous acid solution (200)	1	≤1.8 ± 0.0	≥2.1	≥99.2
	Hypochlorous acid solution (200)	10	≤1.8 ± 0.0	≥2.1	≥99.2
	Untreated Control (DMEM)	0.5	3.9 ± 0.0	-	-
	Untreated Control (DMEM)	1	3.9 ± 0.0	-	-
	Untreated Control (DMEM)	5	4.0 ± 0.3	-	-
	Untreated Control (DMEM)	10	3.9 ± 0.1	-	-
2	Hypochlorous acid solution (100)	1	≤1.8 ± 0.0	≥2.1	≥99.2
	Hypochlorous acid solution (100)	5	≤1.8 ± 0.0	≥2.1	≥99.4
	Hypochlorous acid solution (100)	10	≤1.8 ± 0.0	≥2.1	≥99.2
	Untreated Control (sterile water)	1	3.9 ± 0.1	-	-
	Untreated Control (sterile water)	5	3.9 ± 0.1	-	-
	Untreated Control (sterile water)	10	3.9 ± 0.1	-	-

Figure 1. Results of viral titration after treatment with HOCl (50, 100 and 200 ppm) during different contact times (30 seconds, 1, 5 and 10 minutes). Sample points on the dots line (100 and 200 ppm) are below the detection limit of the technique (1.8log TCID50/mL).



DISCUSSION

This study provides an alternative solution to inactivate SARS-CoV-2 from skin and surfaces instead of alcohol-based products and demonstrates high effectiveness from 1 minute onwards at ≥100 ppm of HOCl. The principal advantage of HOCl compared to hydro-alcoholic antiseptics is that HOCl is innocuous at the effective concentrations and no skin damage effects have been reported. In fact, Ocudox™ is a non-toxic, non-irritating and non-sensitizing ocular antiseptic based in HOCl, which is a potent inorganic compound produced by all mammals and is part of the immunity system. HOCl can be obtained in vitro by electrolyzing NaCl, which releases mainly NaCl and HOCl, is effective against many pathogens and is cheap to produce (3). Moreover, according to our results, HOCl could be a potential disinfectant of non-porous surfaces for the indicated contact times, as food bricks, envelopes or containers. Up to now, we agree with other authors that there is a little risk of SARS-CoV-2 transmission through fomites (5), although different environmental stability has been reported regarding Omicron variant among previously reported variants (6). Thus, proper hand-washing and disinfection are still recommended since it is an effective ways to avoid infectious pathogen transmission.

CONCLUSION

Our studies showed that the HOCl products represent a valid virucidal alternative to inactivate SARS-CoV-2 potentially present in skin or surfaces.

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Conflict of interest: CG a is full time employee of Brill Engines S.L. The other authors do not declare any conflict of interest.

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Ethical approval: All procedures performed in studies involving human participants were in accordance with the institutional and/or national research committee's ethical standards and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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Bacterial contamination of propofol vials: The second report from Turkey

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ABSTRACT

Objective: In this study, we look at the case report of an outbreak of sepsis in patients who underwent upper gastrointestinal endoscopy or colonoscopy during three consecutive days. Twelve patients had diagnostic procedures in the endoscopy unit between 05 May 2018 and 07 May 2018. Of the 12 patients, three had upper gastrointestinal endoscopy, six had a colonoscopy, and three had a combination of two procedures. Within two days of discharge, five patients diagnosed with SIRS and referred with fever as the major sign were hospitalized to the infectious diseases clinic. In our Endoscopy Unit, media, drug, and material cultures were taken for microbiological analysis, and microbial agents were searched. Growth was detected only in the propofol drawn into the syringe that was used on the patient. This study highlights the importance of strict compliance with aseptic injection guidance and constant analysis of microbiological data

Keywords: Propofol vial, Contamination

INTRODUCTION

There are many benefits to using propofol over other intravenous anesthetics, benefits such as early onset and rapid elimination, fewer side effects, and short duration of action (1). Propofol lipid emulsion can be associated with microbiological contamination, which has two sources: intrinsic, which comes from the manufacturing environment, or extrinsic, which happens after opening the vial, and extrinsic contamination is usually more common (2). Although microbiological contamination has sometimes led to the outbreak of sepsis and postoperative infections in the United States and developed countries (3), it has not received much attention in developing countries and Turkey. As far as we know, in Turkey, only one study has been conducted on propel contamination and its clinical significance. Problems and deficiencies in aseptic techniques can lead to viral or bacterial infections. Suppose a contaminated solution is injected into a patient. In that case, the symptoms of sepsis can appear in less than a few hours and can even be fatal to the patient (4). One of the opportunistic bacterium seen in cases of bacterial and wound infection outbreak is Serratia marcescens (5). Due to the high crude mortality rate of bacteremias (about 35% to 60%), these infections should be taken seriously (6, 7). In this study, we look at the case report of an outbreak of sepsis in patients who underwent upper gastrointestinal endoscopy or colonoscopy during three consecutive days.

MATERIAL and METHODS

This study has been conducted using the Helsinki Declaration's principles and approved by the local Institutional Review Board.

Twelve patients had diagnostic procedures in the endoscopy unit between 05 May 2018 and 07 May 2018. Of the 12 patients, three had upper gastrointestinal endoscopy, six had a colonoscopy, and three had a combination of two procedures. All patients were discharged on the same day after successful, uncomplicated procedures.

Sepsis diagnosis was based for the patients who were isolated S. marcescens from blood culture and met two or more from the following four parameters over three hours: 1) fever (>38°C); 2) leucocytosis(>12 x 109/L) or leucopenia (<4 x 109/L) or >10% immature (band) forms; 3) tachycardia (> 90 beats per minute); 4) tachypnoea (> 20 breaths per minute) or hyperventilation (pCO2< 4.3 kPa) .8

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Statistics

Statistical analyzes were performed with SPSS Version 22.0 (SPSS Inc, Chicago, IL, USA). Chi-brothers to design what each could be. Very convenient logistic regression analyzes were performed for predictors of culture positives. Statistical influences are included in the regression analysis. Statistically, P <0.05 was considered significant.

RESULTS

Within two days of discharge, five patients diagnosed with SIRS and referred with fever as the major sign were hospitalized to the infectious diseases clinic. The patient was hospitalized, and their vitals were checked. Antibiotic treatments were started. The fever subsided within 48-72 hours. Meropenem-Levofloxacin was used for their treatments. During admission, mean values (range) for white blood cell, C-reactive protein, aspartate aminotransferase, alanine aminotransferase, urea, and creatinine of SIRS patients were respectively 22900 mg/L (range, 3600 to 39000), 7.8 mg/L (range, 0.27 to 13), 77.3 U/L (range, 13 to 172), 65.4 U/L (range, 14 to 212), 30 mg/dl (range, 15 to 41), 1.14 µmol/L (range, 0.66 to 1.92). Demographic and laboratory characteristics of patients are shown in **Table 1**.

Four of these five SIRS patients had positive blood cultures with S. marcescens, and all strains were uniformly susceptible to meropenem (MICs<0.25 mg/l) and levofloxacin (MICs<0.25 mg/l).

Cultures were obtained from the environment, water, and surfaces in the endoscopic intervention room and shown in **Table 2**.

In propofol, S. marcescens was identified. Endoscopic procedures were not performed on the same day but on different days and times. Propofol serial number 17382033 used in all cases with culture was removed. Closed propofol vials of the same batches were correspondingly cultured and found sterile. Incident notification to the "Ministry of Health" and "Turkey Pharmaceuticals and Medical Devices Agency" was performed.

Following obtaining samples from possible infection sources, further use of the endoscopy unit was suspended for three days. After consulting and receiving the opinions of the anesthesiologist and other personnel in the unit, the mentioned problems were noted. A written protocol for daily cleaning included three cleaning stages at the beginning of the day, between operations, and at the end of the day. New instructions for storing, preparing, and using medications were also introduced. Determining which materials should be stored in the endoscopy unit was the responsibility of the hospital infection control team, and infection control procedures were instructed for the theatre personnel.

The endoscopy unit was suspended for three days after obtaining samples from possible infection sources. Opinions and suggestions of the anesthesiologist, technician, and other healthcare professionals working in the endoscopy unit were taken, and the problems they emphasized regarding their daily work routines were noted. A new guide has been created to prepare, store, and use drugs handled in the clinic. A new protocol has also been developed for cleaning measures to be performed before, between, and after endoscopic procedures. The in-hospital infection control committee determined the materials and drugs to be kept and excluded in the endoscopy unit. The staff of the endoscopy unit was informed about infection control procedures.

Table 1. Demographic and laboratory characteristics of patients

Operations	Patient 1 Endoscopy/Colonoscopy/Endoscopy Biopsy	Patient 2 Endoscopy/Colonoscopy/Endoscopy Biopsy	Patient 3 Colonoscopy/ Biopsy	Patient 4 Flexible Sigmoidoscopy	Patient 5 Colonoscopy
First-day WBC	38.000	39.000	13.000	3.600	21.000
Third-day WBC	26.000	40.000	6.000	24.000	9.00
Fifth-day WBC	9.000	16.000	2.96	Discharged	Discharged
First-day CRP	13	5.97	8.8	0.27	11
Third-day CRP	7	13.85	15.3	11.87	10
Fifth-day CRP	1.13	6.72	2.96	Discharged	Discharged
First-day AST/ALT	19/14	105/61	13/14	23/26	172/212
Third-day AST/ALT	22/16	45/50	26/18	86/80	65/122
Fifth-day AST/ALT	20/16	17/27	52/46	Discharged	Discharged
First-day urea/creatinine	39/0.84	41/1.26	21/10.2	34/1.92	15/0.66
Third-day urea/creatinine	26/0.71	64/108	13/0.86	68/4.46	11/0.63
Fifth-day urea/creatinine	28/0.72	41/0.75	11/0.65	Discharged	Discharged

Table 2. Cultured sources in the endoscopic intervention room

Source	Organism
Vial of propofol in use	Serratia marcescens
Unopened vials of propofol	Negative
Disinfectant in use	Negative
Unopened disinfectant	Negative
Water from the suction system	Negative
Endoscopic channel	Negative
Colonoscopic channel	Negative

DISCUSSION

To our knowledge, this is the second report of its kind in Turkey. In 2019, Cilli et al. reported an outbreak of sepsis caused by propofol contaminated with S. marcescens in three patients (4).. Although propofol has been used in Turkey since 1990, no sepsis outbreaks of sepsis have been reported since then. However, generally accepting sepsis as a surgical complication can cause an outbreak to be undiagnosed.

In our Endoscopy Unit, media, drug, and material cultures were taken for microbiological analysis, and microbial agents were searched. Growth was detected only in the propofol drawn into the syringe that was used on the patient. Patients were hospitalized in the Infectious Diseases Clinic by making their first interventions in the Emergency Service. Infection Control Committee meeting was held, and the clinical status of the patients and the precautions to be taken were discussed. The high-level disinfectant effectiveness check was repeated, and positive results were obtained.

The first outbreak reported due to contaminated propofol was published in 1992 and was a surgical field infection caused by S. aureus in the USA (3). In the literature, twenty propofol-related outbreaks have been reported to date. In these outbreaks, 144 cases were infected, and 10 patients died. Four outbreaks involving S. marcescens have found their place in the literature, and the 5th reported outbreak is this study (9). In 2014, Ersoz et al. reported a meningitis outbreak because of S.marcescens after spinal anesthesia (10). In 2017, Us et al. reported an outbreak of soft tissue and wound infection of S. marcescens in subjects undergoing wound care (11)

Medications and parenteral solutions contamination by S. marcescens have been the source of prior hospital-acquired infection outbreaks (12). Prefilled syringes, prepared solutions, and Multi-dose vials are essential infection tools (13, 14). S. marcescens can cause bacteremia, respiratory infections in ICU, and surgical site infections after invasive procedures (14, 15). In the present study, a previously prepared anesthetic drug is contaminated with S. marcescens. The main problem in this outbreak was re-using vials and standard syringes that may have caused contamination during the outbreak. In the post-outbreak evaluation, it was observed that some drugs were used a few days after they were prepared, in violation of hospital policies. In a performance-based payment system in Turkey, it is expected from the surgeons to make more surgery. Anesthesiologists have a short time to provide medicines between surgeries, which can sometimes fail to comply with basic infection control measures. Also, it was not practical to use disposable propofol bottles as “single-use.”

One of the limitations of this study is that all the data in this study came from one institution, and some related details of the influencing factors and event histories may not be adequately documented, which may affect the outcome. Therefore, interpretations of the results of this study should be made with caution.

CONCLUSION

Outbreaks caused by contaminated propofol continue to find a place in the literature. In the outbreak presented in this study, S. marcescens was separated from an opened propofol bottle and salt solution in the garbage and various syringes filled with propofol. Cultures made in unopened propofol ampoules were found sterile. This study highlights the importance of strict compliance with aseptic injection guidance and constant analysis of microbiological data.

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Ethical approval: All procedures performed in studies involving human participants were in accordance with the institutional and/or national research committee's ethical standards and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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A cytomegalovirus induced cavitary pneumonia case in a patient with idiopathic thrombocytopenic purpura under corticosteroid treatment

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ABSTRACT

Objective: Cytomegalovirus infection is common in the neonatal period, during childhood, while in adults, it is encountered in immunosuppressed patients. CMV infection is a serious cause of mortality. CMV pneumonitis is seen most frequently in adults, even if ganciclovir treatment is given prophylactically after stem cell transplantation and it is seen at least after kidney transplantation. In this article, we present a case of severe cavitary pneumonia that develops in a patient with prolonged prednisolone therapy due to ITP.

Keywords: Idiopathic Thrombocytopenic Purpura, Pneumonia, Cytomegalovirus

INTRODUCTION

Cytomegalovirus (CMV) is a DNA virus from the herpesvirus family. CMV is found in saliva, upper respiratory tract, leukocytes, breast milk, urine, stool, in all body fluids and is transmitted by contact with one of them (1). Once ingested, CMV remains infected for life. It is also known to be transmitted by blood transfusions and transplantation organs. Virus infections are divided into two as primary and secondary. Primary infection is asymptomatic in people with good immunity. Secondary infection is seen in individuals with suppressed immunity. For example, opportunistic infections associated with CMV are frequently seen in patients after the organ transplantation (2). In these patients, CMV causes fever, lymphadenopathy, rash, and mononucleosis-like symptoms accompanied by lymphocytosis, causing severe mortality and morbidity by involving organs such as the eye, kidney, gastrointestinal system, liver, and even lung (3).

CASE

A 46-year-old male patient was admitted to our internal medicine outpatient clinic with weakness, cough, sputum, fever and chest pain complaints for about 4 weeks. The patient applied to various physicians for the last 3 weeks and used amoxicillin-clavulanic acid 1000 mg 2x1 tablet, clarithromycin 500 mg 2x1 tablet for 10 days, moxifloxacin 500 mg 1x1 tablet for 7 days. In his physical examination, his general condition was poor. He was conscious, his abdomen was comfortable, his respiratory rate was 18 / min, his pulse was 100 / min, his blood pressure was 100/60 mmHg, traube was closed in the abdominal examination, crepitant ral was found in both lung breath sounds, in the first examinations performed upon hearing murmur in the right hemithorax WBC was 18.0 10.3/ql (normal value: 4.1-11.0), (40% neutrophils, 50% lymphocytes, 5% monocytes, 5% other), CRP was 260 mg/L (normal value 0-6), Hb was 12.1 g/dl (normal value 11-15), platelet count was 102.0 10.3/ql (normal value 150-400). As there were consolidated areas in the right lung parenchyma in his anteroposterior lung radiography, he was hospitalized in the internal medicine service with a prediagnosis of pneumonia. The patient has a history of the stent in known coronary arteries and was followed up in our service 3 months ago to investigate the etiology of rash and thrombocytopenia. The patient was diagnosed with idiopathic thrombocytopenic purpura (ITP) due to the examinations.

Case Report Article

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Acute viral markers for etiogenesis were negative (EBV IgM negative, IgG positive, CMV IgM negative, IgG positive, HSV-1-2 negative, Anti-HIV negative…). Malignancy screening were negative (gastroscopy, colonoscopy, whole abdominal ultrasonography, contrast-enhanced thoracic and abdominal tomography, tumor markers). As a result of the bone marrow biopsy, ITP diagnosis was made. Blood, urine, sputum, and stool cultures were sent from the patient because of 39 degrees fever in the first 24 hours of the patient's intermission to the service. It was planned to search for ARB in sputum for 3 days. No characteristics were observed in other biochemical and coagulation parameters sent. Pantoprazole 40 mg 1x1, inhaler salbutamol 4x1, wide spectrum intravenous piperacillin-tazobactam 3x 4.5 g with intravenous antipseudomonal activity, Intravenous trimethoprim sulfamethoxasol with pneumoecystis jiroveci sensitivity 400mg 3x1, N-acetyl-cysteine 600 mg peroral 2x1 were started prophylactically. The dose of corticosteroid used by the patient for ITP treatment was reduced by half, and IVIG at 1 gr/kg was given for 2 days. Viral markers were sent. His fever reached 39 degrees in the first 72 hours, and maculopapular rashes were observed in the upper extremities. Spleen size was reported as 130 mm in the whole abdominal ultrasound.

No vegetation was observed on electrocardiography and transthoracic echocardiography. Tuberculin skin test was performed. The test resulted in 2mm at 48th and 72nd hours. Unenhanced thoracic tomography was performed. A cavitary lesion in the right hemithorax and a consolidated area in the parenchyma were observed. Salmonella, toxoplasma, and brucella agglutination tests were negative. HAV, HBV, HCV and HIV, heterophile antibody, EBV, and VCA IgM were negative. No reproduction was observed in blood, urine, and sputum cultures. WBC increased to 22.0 10.3/ql and CRP to 580 mg/l on the 4th day of the patient's hospitalization. Since among the viral markers sent, CMV avidity was low, Anti CMV IgM was 1.40 index positive, Anti CMV IgG was >250.0 AU/mL, CMV PCR was sent, ganciclovir 5mg/kg 2x1 was initiated for the patient in consultation with the infectious diseases specialist. CMV PCR was requested to be sent in bronchoalveolar lavage, but it could not be sent because the patient did not accept the bronchoscopy procedure. Clinical response was observed in the first 48 hours. WBC decreased to 14.0 10.3/ql and CRP 172 mg/L. Thrombocyte count was above 100.0 10.3/ql during follow-up. Ganciclovir treatment was continued for 15 days. He had no fever in his follow-up.

Table 1. Course of CMV IgM and IgG Antibody Titers by Weeks in the Case

	CMV IgM	CMV IgG
First admission	negative	1.8
Second admission	>250	1.4
In the 2nd week of treatment	11	18
In the 4th week of treatment	10	20

Figure 1. Thoracic examination of the case at the time of diagnosis and after treatment (1st month) due to pneumonia

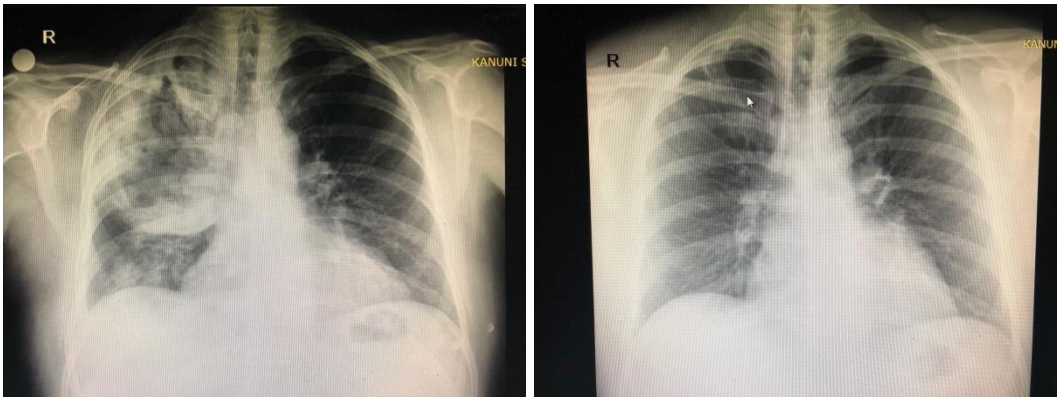

Figure 2. Anteroposterior lung radiography examination of the case at the time of diagnosis and after the treatment (1st month)

In the physical examination, murmur and crepitant rales that were heard by listening to the respiratory system disappeared. Consolidated areas were observed to be regressed, and the cavity to become smaller in the non-contrast thoracic tomography performed as a control. Since the titer of the CMV IgG sent increased, CMV IgM decreased, WBC was 8.2 10.3/ql, CRP was 6 mg/L, thrombocyte count was 104.0 10.3/ql, the patient was transferred to the general surgery unit of our hospital for splenectomy operation.

DISCUSSION

While CMV IgM was negative and CMV IgG was positive, which was sent in our patient's first hospitalization due to thrombocytopenia, the fact that CMV IgM was positive, CMV IgG was positive, CMV PCR was positive, low CMV avidity, which was sent at the second hospitalization due to pneumonia after 3 months of prednisolone use, supports the diagnosis of CMV pneumonia. Since CMV pneumonia can be confused with interstitial pneumonia such as Pneumocystis carinii and Pseudomonas aeruginosa, which are other opportunistic microorganisms, the antibiotic treatment of our patient was continued, but no bacterial growth was observed.

Most people infected with acute CMV have no symptoms suggestive of infection. Clinically indistinguishable symptoms from mononucleosis caused by Epstein Barr virus may develop in 7% of cases with primary CMV infection. Since the immunity is suppressed, reactivation develops when the CD4 count decreases (3). The emerging severe disease manifestation can usually manifest itself with colitis, interstitial pneumonia, hepatitis, meningoencephalitis, myelopathy, bone marrow suppression or retinitis findings. Besides, nonspecific skin rashes may accompany them. In most of the cases, a microbiologically proven source of infection cannot be found (4). Hemorrhagic colitis, abdominal pain, fever may mimic inflammatory bowel disease in gastrointestinal involvement. While mild liver enzymes increase in patients with hepatitis, bilirubin levels generally maintain their normal range. Portal vein thrombosis associated with CMV colitis has been shown in some cases (5). In some immunosuppressed patients, anterior uveitis was observed in the eye examination performed for eye-related complaints, and among the causative agents is CMV after HIV (6). Cardiac involvement is among the mortality of CMV infections in some patients who have received immunosuppressed therapy for a long time, and it was shown that CMV was isolated in endomyocardial biopsy specimens in autopsies (6).

In CMV pneumonia, fever, cough, sputum, and shortness of breath complaints like pneumonia caused by other factors develop. The consolidated area on lung radiography is irregular, and diffuse. Clinical findings, bronchoalveolar lavage (BAL) quantitative culture and CMV PCR method and viral cultures can be used for diagnosis.

The frequent detection of CMV, along with other bacterial pathogens in BAL has made the role of CMV controversial. The majority of CMV infections occur with the reactivation of the latent virus within the first three months after transplantation. (7) Studies conducted so far have shown that 14-day ganciclovir treatment is the most effective antiviral agent in CMV pneumonia. In cases where ganciclovir is insufficient or if there is eye involvement, the use of valganciclovir, foscarnet sodium and cidofovir may included (8).

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