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SAFETY AND HEALTH AT THE WORKPLACE IN THE CONTEXT OF COVID-19: THE CASE OF A DENTAL CLINIC

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ABSTRACT

Governments of different countries and healthcare organisations working in various areas face enormous challenges when trying to combat the COVID-19 pandemic and protect employees, their families and communities. Workplaces can be high-risk environments in terms of the virus outbreak and transmission. This paper aims to disclose the ways for workplace safety improvement in dentistry in the context of COVID-19. The authors present the theoretical model of workplace safety improvement with regard to COVID-19 infection prevention and control measures. The expectations, fears and tasks of dental employees at their workplace in the context of the COVID-19 pandemic were investigated based on the systematic literature review and the qualitative empirical study conducted in Lithuania. The study disclosed that unmet employee expectations could lead to different kinds of fear; the most common sources of anxiety are linked to a higher risk of getting infected, a lack or misuse of protection measures and inadequately performed work. Occupational risks are closely related to the components of a workplace system. Therefore, it is important to apply a holistic approach to improve workplace safety, enhance work performance and minimise the negative effects on an employee, an organisation, a patient and a society.

KEY WORDS

workplace safety; COVID-19 pandemic; dentistry

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INTRODUCTION

The outbreak of coronavirus disease (COVID-19) in Wuhan, China, has evolved rapidly into a public health crisis and spread exponentially worldwide (Ather et al., 2020). COVID-19 is an interna-

tional public health emergency announced by the World Health Organization (WHO) in January 2020 and declared a pandemic in March 2020 (Stangvaltaite-Mouhat et al., 2020; Khunti et al., 2021). Despite the global efforts to stop the spread of the disease and

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the advantages afforded by vaccination, the number of cases is still high leading to the emergency status in the entire health system, including dentistry (Ather et al., 2020; Consolo et al., 2020; Agius et al., 2021). The pandemic did not bypass Lithuania either. To date (23 February 2022), Lithuania has recorded 879371 confirmed cases of COVID-19 and 8316 deaths, a 14-day notification rate of newly reported COVID-19 cases per 100 000 population was 3647.4 (COVID-19 in Lithuania). The pandemic has had a direct impact not only on health but also on markets, supply (production of goods and services), demand (consumption and investment) and the ways of work. Governments, employers and workers face enormous challenges when combating the COVID-19 pandemic and protecting their staff, families and communities (Ingram et al., 2021; ILO, 2020).

The current pandemic is a hot topic which has attracted considerable academic attention in different areas of science. The World Health Organization, the International Labour Organization (ILO), and national authorised healthcare organisations expressed great concern and proposed measures to manage the COVID-19 pandemic. A growing interest in COVID-19 was demonstrated in numerous research works conducted in different countries. Scientists, WHO and ILO examined employee safety behaviours and workplace safety management practices (Lee, 2022; Vu et al., 2022), prevention and control measures in workplace settings (Agius et al., 2021; Ingram et al., 2021; ILO, 2020; COVID-19: Occupational health and safety for health workers, 2021), the issues of workplace preparedness (Stangvaltaite-Mouhat et al., 2020; Andújar Trabazos et al., 2021), a psychological impact of the COVID-19 pandemic (Stangvaltaite-Mouhat et al., 2020; Uhlen et al., 2021), risks to healthcare workers (Khunti et al., 2021; Strain et al., 2021), employee satisfaction (Uhlen et al., 2021), workforce confidence (Liu et al., 2022), the fear of being infected and fired (Chen et al., 2022), and other work-related changes when dealing with the pandemic. Workplaces can be high-risk environments in terms of SARS-CoV-2 outbreaks and subsequent community transmissions (Ingram et al., 2021). The pandemic puts extraordinary pressure on healthcare professionals and negatively affects the delivery of health care services globally (Uhlen et al., 2021). Ensuring safety and health at work remains a top priority for organisations (Chen et al., 2022).

Although the scientific community has widely analysed the issues related to the COVID-19 pandemic and its prevention, this topic is still relevant as

the pandemic is not going away and will potentially change the nature of work and workplace safety. There is still a literature gap and the need to understand how occupational risks affect a workplace system and what effects these risks have on an employee, a patient, an organisation and a community. The purpose of this paper is to explore the relationship between occupational risks and workplace safety in dentistry. Additionally, the authors have investigated the expectations, fears and tasks of dental employees at their workplace in the context of the COVID-19 pandemic. Based on the research results, specific recommendations regarding workplace safety in the area of dentistry were provided. The paper employs the systematic literature review and the qualitative empirical study conducted in Lithuania in 2021–2022.

1. LITERATURE REVIEW

Organisations adopt occupational health and safety management systems to control the hazards and ensure a safe work environment and the health of their employees. During this pandemic, organisations emphasise workplace safety to mitigate health risks and manage the problems specific to the crisis (Vu et al., 2022). Dentists face a heightened risk of infection with their proximity to the oral cavity (Liu et al., 2022). The dental practice involves close contact with a patient and the use of rotating and surgical instruments that generate a visible spray containing droplets of water, saliva, blood, microorganisms and other debris (Stangvaltaite-Mouhat et al., 2020; Uhlen et al., 2021; OSHA, 2022). Dental professionals can deal with patients with a suspected or confirmed infection and need to work diligently not only to provide care and treatment but also to prevent the spread of infection (Ather et al., 2020). Given the risks, a dental office may become a site of cross-infection if adequate precautions are not taken (Uhlen et al., 2021).

Healthcare workers experience discomfort and occupational hazards that put them at risk of illness and even death from exposure to COVID-19. According to the guide (2021) issued by the World Health Organization (2020) and the International Labour Organization, these occupational risks include occupational infections with COVID-19; skin disorders and heat stress from the prolonged use of personal protective equipment (PPE); exposures to toxins because of the increased use of disinfectants; psychological distress and chronic fatigue. The use of additional protection measures requires additional time,

burdens workers and reduces their productivity. Risk mitigation, workplace safety and employee well-being improvement in the healthcare sector require risk assessment, well-coordinated and comprehensive infection prevention and control measures, occupational health and safety management, and mental health and psychosocial support (WHO, 2020; ILO, 2021). On the contrary, insufficient health and safety measures can lead to increased illness rates among healthcare workers and patients, high rates of absenteeism, reduced productivity and deteriorated quality of health services (ILO, 2020).

Jahangiri et al. (2013) described risk perception as “an individual’s subjective judgment about the characteristics and severity of risks”. Risk perception is one of the characteristics of a person that affects an

individual’s behaviour, so a misperceived risk leads to insecurity in the workplace; therefore, investigating risk perception plays an important role in ensuring workplace safety (Jafari et al., 2019) and individual work output (Shan et al., 2022; Szydło & Grzes-Bukłaho, 2020).

The fear of COVID-19 as a significant mental health moderator was analysed by Blanuša et al. (2021). The fear of infection influences the presence of job insecurity and work-related distress. The results of the research conducted among Italian dentists confirmed the relationship between job insecurity and depressive symptoms (Gasparro et al., 2020). Eman et al. (2021) investigated that the fear of COVID-19 was negatively associated with job satisfaction. Anxiety about possible COVID-19 infection

Tab. 1. COVID-19 infection prevention and control measures

AREA/ DIRECTION	IPC MEASURES	DESCRIPTION
Prevention and deterrence	Surveillance and response	COVID-19 symptom monitoring, strategies to screen or test individuals; contact tracing and testing of close contacts; quarantine; self-isolation of confirmed cases
	Physical distance	Organising work in a way that allows for physical distancing between people; when possible, using phone calls, emails or virtual meetings rather than face-to-face meetings; introducing working shifts to avoid large concentrations of workers in the facilities at any given time
	Changes in work arrangements	Facility zoning, entrance restrictions; changes in assignments for high-risk workers; facility shutdown, expanded access to paid sick leave, sickness benefits and parental/care leave
	Environmental adjustments	Improving airflow and ventilation; use of easily decontaminated physical barriers or partitions between patient treatment areas
	Teledentistry	Remote facilitation of dental treatment, guidance and education via the use of information technology instead of direct face-to-face contact with patients for non-emergency dental situations
Hygiene and PPE	Hygiene, cleaning and disinfection	Promoting good respiratory hygiene at workplaces; regular disinfection of common areas; promoting a culture of handwashing, cleaning the surfaces of desks and workstations, telephones, keyboards and work objects; application of UVC light for disinfecting surfaces of equipment, operating rooms and PPE
	Appropriate PPE	Selection and provision of appropriate PPE: masks and respirators for respiratory protection, goggles and shields for eye protection, gloves for hand protection, and gowns for body protection; providing closed bins for hygienical disposal of PPE
Administrative	Education and training	Education and training on IPC measures; training on the correct use, maintenance and disposal of PPE
	Communication and signage	Maintaining regular communication with workers to provide updates on the situation in the workplace, region or country; communication and signage
	Policy and control	Assurance of adequate resources for IPC; appropriate infrastructure; development of clear IPC policies; appropriate triage and placement of patients; extending operational hours or reducing the number of appointments; adequate staff-to-patient ratios
Combined	Combined measures	Combined application of different types of measures

Source: Elaborated by the author based on the ILO report (2020), Stangvaltaite-Mouhat et al. (2020), Khunti et al. (2021), Ingram et al. (2021), Vu et al. (2022), OSHA (2022), Seladi-Schulman & Can (2022), Ghai (2020).

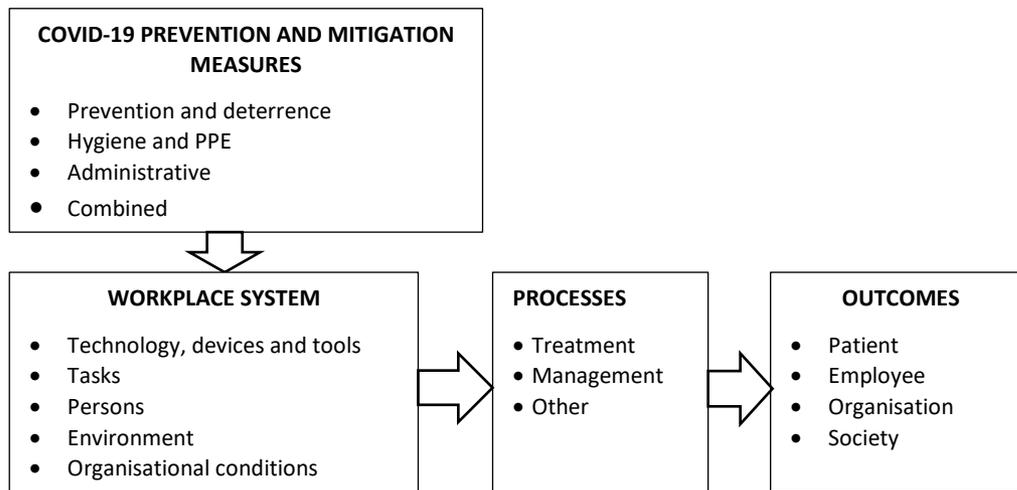


Fig. 1. Theoretical model of workplace safety improvement in the context of COVID-19

Source: Elaborated by the author based on Carayon et al. (2006).

in the workplace is an important issue in occupational mental health. The effects of the COVID-19 pandemic on workplaces may influence the changes in employee anxiety. Anxiety related to COVID-19 caused distrust and anger among employees. The anxiety about being infected with COVID-19 in the workplace strengthens the relationship between job demands and psychological distress (Eguchi et al., 2021)

A safe workplace, access to the appropriate equipment and implementation of the appropriate infection control measures are critical in reducing the fear of infection and the feeling of instability reported by dental professionals working with patients during the pandemic outbreak (Uhlen et al., 2021). Various measures can be taken to reduce the risk of contagion between dental professionals and patients. Based on the ILO report (2020) and other literature sources (Stangvaltaite-Mouhat et al., 2020; Khunti et al., 2021; Ingram et al., 2021; Vu et al., 2022; OSHA, 2022; Seladi-Schulman & Can, 2022; Ghai, 2020), Table 1 summarises the main COVID-19 infection prevention, control (IPC) measures, and provides their description.

The measures in Table 1 are divided into four groups, covering prevention and deterrence, hygiene and PPE, and administrative and combined measures. A combination of preventive and hygiene measures with management's commitment to safety and employee involvement is extremely important to ensure workplace safety.

Carayon and Smith (2006) developed a work system and patient safety model that includes a work system (persons, tasks, tools and technologies, physi-

cal environment, organisational conditions), processes and outcomes. Based on this model and literature analysis (Ciarniene et al., 2017; WHO, 2020), the authors of this article present a theoretical model of workplace safety improvement with regard to COVID-19 infection prevention and control measures (Fig. 1).

A dental practitioner performs different tasks by using a variety of technologies, medical devices and tools. These tasks are performed in a specific physical environment and under certain organisational conditions. The five components of the work system interact and affect each other (Carayon et al., 2006). The workplace system affects the process performance, which, in its turn, makes an impact on patient, employee and organisation outcomes (Carayon et al., 2006). In the context of COVID-19, the changes in different aspects of the work system had to be made by adding new safety procedures, monitoring, personal protective equipment, environmental adjustments, regular disinfecting, changes in work arrangements, and altering patient scheduling and staffing to meet safety recommendations (Liu et al., 2022).

Without a doubt, these changes affect treatment, management and other processes, and it all affects the physical and mental health of employees (skin disorders and heat stress from the prolonged use of PPE, exposures to toxins because of the increased use of disinfectants), job satisfaction and stress, productivity and organisational performance, quality and availability of healthcare services, and patient safety. Patient, employee and organisational outcomes impact society in general, thus contributing to the

prevention of the infection or, conversely, promoting its spread.

2. RESEARCH METHODS

The study was conducted in a dental clinic located in Kaunas city, Lithuania. The clinic provides therapy, prosthetics, endodontic, periodontal, orthodontic and oral hygienist services. The clinic has 28 employees, including administrative staff. The study was conducted as a part of the project “Prevention of airborne transmission of respiratory viruses (COVID-19) in dental services”. The project aims to develop a tool to stop the spread of the COVID-19 virus and to safely provide dental services during the global pandemic. To achieve the aim of the project and develop an innovative product, R&D activities were implemented. The project was launched in January 2021 and is due to end by April 2022. The project is funded by the European Regional Development Fund as part of the European Union’s response to the COVID-19 pandemic.

Qualitative interviews were used to collect the empirical data. According to Kallio et al. (2016), semi-structured interviews are versatile and flexible; they ensure reciprocity between an interviewer and a participant and allow for improvising when asking further questions based on a participant’s answers. The purpose of qualitative research is to know, understand and describe social phenomena, people’s experiences, and social interactions that take place in a certain environment and to reveal how research participants make meaningful experiences, interactions and how they behave in their everyday life (Žydzūnaitė & Sabaliauskas, 2017, Czerniawska & Szydło, 2020). This method makes it possible to obtain detailed opinions and assessments about the ongoing phenomena and gain an insight into the respondents’ daily professional experience at the workplace. A qualitative interview is based on open-ended questions. It is expected to provide the answers as broad, comprehensive and open as possible, formulated and presented by research participants,

reflecting their perspective (Gaižauskaitė & Valavičienė, 2016).

Sample size. Achieving data saturation is important in qualitative research. Various sources recommend different sample sizes, which may range from 5 to 60. According to Hennink and Kaiser (2022), data saturation can be achieved even with a “small” sample, such as 9–17 interviews. This research involved a sample of nine respondents. The respondents were selected by using the principle of targeted sampling, while the principle of random sampling was rejected. The respondents with personal experience, responsibility, characteristics and social contexts allowing them to answer the interview questions with appropriate accuracy were sought. The interviews with the staff were approved by the management of the dental clinic; staff participation was voluntary. The research involved one oral hygienist, one endodontist, five dentists, one orthopaedist and one periodontist; one respondent was male, and eight were female. All the respondents had at least three years of work experience in the area of dentistry. The research process is presented in Fig. 2.

The internal marketing theory claims that employees are internal customers in each organisation (Huang & Rundle-Thiele, 2014). The Value Proposition Canvas approach was used to understand how to reconcile workplace safety requirements with internal customer needs. According to Adams (2015), a questionnaire is not the best term for the compilation of semi-structured interview questions; therefore, the agenda for the interview guide was developed based on the customer profile and covered three categories of questions related to internal customer jobs, pains and gains. The questions in the section “Gains” aimed to explore the expectations of the employees as internal customers at the workplace and disclose what creates the employee value during the time of the Covid-19 pandemic. The questions in the section “Pains” aimed to reveal the negative experiences, emotions and perceived risks that the employees can face at the workplace. Finally, the questions in the section “Jobs” focused on daily task performance

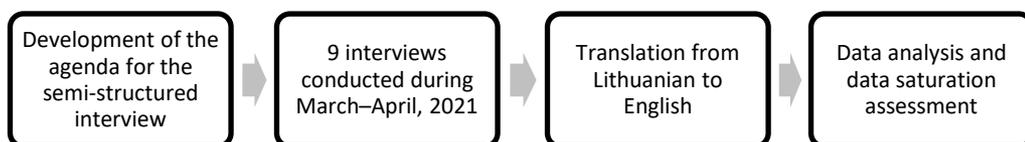


Fig. 2. Flow diagram of the research process

from the functional, social and emotional perspectives. The interviews were transcribed following confidentiality obligations not to reveal the identity of the respondents. The data were processed by interpreting, systematising, analysing and categorising the answers. The evidence citations are presented in categories and subcategories.

3. RESEARCH RESULTS

The analysis of the employee expectations revealed that the respondents expected to feel safe, protect themselves and others from viruses and save time for task performance (Table 2).

According to the respondents, an effective and convenient protection measure against airborne viral

diseases would allow the tasks to be performed efficiently and would reduce employee anxiety and loss of time. It is obvious that unmet employee expectations can lead to different kinds of fear. The most common sources of anxiety are linked to a higher risk of getting infected, the lack or misuse of protection measures and inadequately performed work. Compliance with safety requirements and additional measures results in a waste of time and raises the probability of mistakes at the workplace (Table 3). The respondents' answers disclosed the necessity for innovative specific devices and combined measures.

Day-to-day workplace operations involve compliance with specific requirements, safety and security measures that cause inconvenience to employees. The demands of day-to-day operations, in their turn, raise employee fears, create discomfort, increase the likeli-

Tab. 2. Links between employee gains/expectations and perceived occupational risk in the workplace

EMPLOYEE GAINS/EXPECTATIONS		
SUBCATEGORY	STATEMENTS	LINKS WITH RISK
Employee expectations	[R2] "Protect me and others from viruses" [R1], [R4] "Safe work environment for a doctor and a patient" [R6] "Work safely without the risk of infection with the virus" [R8] "... return to regular hygiene requirements. To eliminate the need for protection measures" [R2] "Work both safely and ergonomically" [R3] "Work in a safe environment" [R4,5] "Eliminate the need for coveralls, etc." [R6] "Eliminate the risk of infection working regularly, with fewer protection measures" [R7] "Safe" [R8] "...work not constrained by adverse circumstances" [R9] "...work comfortably, with unrestricted movements" [R9] "...feel free working with patients, especially during the procedures with a high prevalence of pathogens, not to feel the risk of infection or bringing viruses home" [R1] "Time-saving working without forced breaks. Comfortable work without wearing so many protective measures" [R2] "I would be glad about both time and money saved" [R9] "Time-saving working without forced breaks. Improved well-being at work, knowing that the risk of infection has been significantly reduced or eliminated" [R6] "Ensuring safety would reduce the risk of infection, save time and eliminate the need for ventilation interruptions between patients; patients would feel safer, they would not need to pay extra for protection measures"	<ul style="list-style-type: none"> • Occupational infections with COVID-19 • Psychological distress • Exposures to toxins because of the increased use of disinfectants • Skin disorders • Chronic fatigue • Extra time
Specific measures/devices against the virus	[R1] "A virus-killing device" [R7] "A device preventing the spread of aerosols" [R4], [R5] "An effective measure for airborne viral diseases" [R6] "the ability to wear fewer protection measures and work at the regular rhythm"	<ul style="list-style-type: none"> • Extra time

Tab. 3. Links between employee pains/fears and perceived occupational risk at the workplace

EMPLOYEE PAINS AT THE WORKPLACE		
SUBCATEGORY	STATEMENTS	LINKS WITH RISK
Anxiety sources	<p>[R1] "Risk of infection"</p> <p>[R2] "Work feeling heat discomfort, pressure, rubbing, etc. caused by protective measures"</p> <p>[R3] "It is hot to work wearing all protective measures, so it is uncomfortable"</p> <p>[R6] "When there is a lack of protective measures, when someone does not follow the protocol, when an assistant forgets to give a rinse, respirators pull ears hard, wearing optics and a shield is uncomfortable, but without wearing a shield, I am not sure if I sufficiently protect myself; it is hot to work wearing all protective measures"</p> <p>[R8] "Infection or inefficiency of the current protective measures"</p> <p>[R2] "Fear to get infected and infect others (patients, colleagues)"</p> <p>[R9] "Ineffective disinfection"</p> <p>[R7] "Fear of poorly performed work"</p> <p>[R9] "Time-saving working without forced breaks. Improved well-being at work, knowing that the risk of infection has been significantly reduced or eliminated"</p> <p>[R6] "Ensuring safety would reduce the risk of infection, save time and eliminate the need for ventilation interruptions between patients; patients would feel safer, they would not need to pay extra for protection measures"</p>	<ul style="list-style-type: none"> • Occupational infections with COVID-19 • Psychological distress • Exposures to toxins because of the increased use of disinfectants • Skin disorders
Time losses	<p>[R1], [R4], [R5] "Disposal of protective equipment, dressing and undressing"</p> <p>[R2], [R3] "Caused by safety measures, dressing and undressing personal protective equipment, its collection/utilisation after use"</p> <p>[R6] "Changing clothing during the procedure if you need to go to another room, consult your colleagues; if you are in protective equipment, you cannot do that, which impedes work (you need to undress and then dress again)"</p>	<ul style="list-style-type: none"> • Extra time • Chronic fatigue
Mistakes	<p>[R9] "Tired of high requirements, employees start not to comply with them"</p> <p>[R2] "Employees incorrectly wear PPE, wear inappropriate PPE or do not wear it at all. They take it off unsafely after use"</p>	<ul style="list-style-type: none"> • Occupational infections with COVID-19 • Chronic fatigue

Tab. 4. Links between employee jobs and perceived occupational risk in the workplace

EMPLOYEE JOBS AT THE WORKPLACE		
SUBCATEGORY	STATEMENTS	LINKS WITH RISK
Requirements	<p>[R1] "Observe high hygiene requirements"</p> <p>[R7] [R8] "Observe the same requirements, understand and support each other"</p> <p>[R3], [R4] "If the purpose is infection control, employees must observe the established requirements"</p>	<ul style="list-style-type: none"> • Occupational infections with COVID-19 • Psychological distress • Exposures to toxins because of the increased use of disinfectants • Skin disorders
Safety and security measures	<p>[R2], [R3] "Protect yourself and others"</p> <p>[R2], [R3] "Wear PPE"</p> <p>[R2], [R3] "Wear PPE safely and comfortably – wear fewer measures or use highly protective equipment"</p> <p>[R6] "Wear extra protection, allow extra time for ventilation"</p> <p>[R9] "...lack of PPE at the beginning of the pandemic"</p>	<ul style="list-style-type: none"> • Occupational infections with COVID-19 • Psychological distress
Inconveniences and discomfort employees want to avoid	<p>[R4], [R5] "A doctor feels uncomfortable wearing three layers of PPE"</p> <p>[R8] "Wearing uncomfortable PPE, waste of time putting it on and taking off"</p> <p>[R4], [R5] "Stress and discomfort"</p> <p>[R2], [R3] "Mistakes"</p> <p>[R6] "Prevent time losses doing everything to protect against the virus and reduce high costs"</p>	<ul style="list-style-type: none"> • Occupational infections with COVID-19 • Skin disorders • Extra time • Psychological distress • Chronic fatigue

Tab. 5. Manifestation of occupational risk in the workplace system

	WORKPLACE SYSTEM				
	TECHNOLOGY, DEVICES, TOOLS	TASKS	PERSON	ENVIRON- MENT	ORGANISA- TIONAL CON- DITIONS
Occupational infections with COVID-19	x	x	x	x	x
Skin disorders and heat stress from the prolonged use of PPE	x		x	x	x
Exposures to toxins because of the increased use of disinfectants		x	x	x	x
Psychological distress		x	x	x	x
Chronic fatigue		x	x	x	x
Extra time needed for PPE and disinfection	x	x	x		x

hood of mistakes, and require extra time to perform direct tasks (Table 4).

The workplace system aims to deliver value and outcomes for different stakeholders, such as patients, dental professionals and organisations. The COVID-19 pandemic affects all the components of the workplace system. Different types of occupational risks can manifest in relation to medical devices, tools and technologies, tasks, persons, environment and organisational conditions (Table 5).

Occupational risk affects the entire workplace system. Technology, devices and tools have to be disinfected, which requires extra time, effort and performance of extra tasks, such as regular disinfection of common areas and surfaces of work objects, use of appropriate PPE and their hygienical disposal and regular ventilation of premises. All of this requires more time for task performance and leads to a reduced number of appointments. Extra tasks raise employee workload and decrease productivity, organisational performance and quality of healthcare services. Consequently, all these risks negatively affect employee motivation and job satisfaction, leading to chronic fatigue and psychological distress. Occupational infections with COVID-19 may affect physical and mental employee health and cause the necessity to reorganise processes, work schedules and patient care procedures. To ensure workplace safety, it is important to educate and train employees on the correct use of IPC measures and PPE, maintain regular communication and update the measures applied in response to the COVID-19 situation. Moreover, it is important to look for new opportunities and con-

sider innovative technologies for virus prevention and deterrence.

4. DISCUSSION AND CONCLUSIONS

This paper investigates the effects of the COVID-19 pandemic on workplace safety when providing dental care services. The research revealed the occupational risks encountered by employees in the workplace and provided insight into how these risks affect employees' daily activities. In terms of a theoretical contribution, this study expanded previous findings of Carayon et al. (2006), proposing that the work system is composed of five components — a person, tasks, tools and technologies, the physical environment and organisational conditions — and plays a key role in delivering smooth processes and providing employee, patient and organisation outcomes. In the context of COVID-19, prevention and mitigation measures and the component of society were integrated into the work system and patient safety model proposed by Carayon and Smith (Carayon et al., 2006). In line with the current study, workplace safety can be ensured by adjusting the components of the work system. COVID-19 prevention and mitigation measures cover the areas of prevention and deterrence, hygiene and PPE, and administrative and combined measures. A combination of these measures affects all components of the workplace system by generating extra tasks and changes in the work environment and organisational conditions. Consequently, these changes affect treatment, managerial and auxiliary processes, which, in

turn, impact physical and mental employee health, job satisfaction, motivation and productivity. Moreover, new requirements for organisational performance arise when providing healthcare services for patients. Dental care organisations also contribute to social outcomes by preventing the infection or, conversely, by spreading it.

It should be noted that the results of the empirical research fit the theoretical background in this particular area. The empirical research focused on workplace safety and work experience of dental professionals in the context of COVID-19. The study framework was based on the theoretical model and the main occupational risk defined by the WHO. The research revealed that dental professionals face the following occupational risks: occupational infections with COVID-19, skin disorders and heat stress from the prolonged use of PPE, exposures to toxins because of the increased use of disinfectants, psychological distress, chronic fatigue and disinfection. Occupational risk management, in many cases, requires extra tasks and extra time.

Similar to previous findings (Stangvaltaite-Mouhat et al., 2020), this research revealed that dental professionals note their expectation to work safely and protect themselves, their colleagues and patients. Workplace safety and lower risks of infection would allow to save time, eliminate the need to have ventilation breaks and would make patients feel safer. Access to adequate PPE is considered to be one of the major protective factors in mitigating the fear of infection and illness among dental care professionals. In terms of anxiety sources, interviewees disclosed the fear of becoming infected if protection does not work properly and the discomfort of wearing different PPE, which also causes skin disorders and requires extra time; these stressors were reported to lead to chronic fatigue and psychological distress.

Similar findings concerning psychological distress and chronic fatigue were provided by Uhlen et al. (2021), Consolo et al. (2020), and Stangvaltaite-Mouhat et al. (2020). In addition, employees were worried about the probability of mistakes and their impact on the quality of dental services. The interviewees emphasised the importance of following specific guidelines to reduce the spread of infection. Specific guidelines refer to the procedures and measures that have to be implemented when providing dental care and treatment services. This confirms the findings provided by Stangvaltaite-Mouhat et al. (2020). At the same time, in some cases, specific guidelines and strict requirements can make employ-

ees tired, less motivated and less satisfied. Based on research results, occupational risks are closely related to the components of the workplace system. Therefore, it is important to apply a holistic approach to improving workplace safety (Khunti et al., 2021), ensure security and health, enhance work performance and minimise the negative effects on an employee, an organisation, a patient and a society.

While the findings offer theoretical contributions and practical insights, the limitations of the study are also worth mentioning. The major limitation of this research is the consideration of the case of a single dental clinic, which led to relatively small sample size. Although data saturation was achieved, further studies could focus on larger-scale research in this area.

LITERATURE

- Adams, W. C. (2015). Conducting semi-structured interviews. In K. E. Newcomer, H. P. Hatry, & J. S. Wholey (Eds.), *Handbook of Practical Program Evaluation* (pp. 492–505). Jossey-Bass.
- Agius, R. M., Kloss, D., Kendrick, D., Stewart, M., & Robertson, J. F. (2021). Protection from Covid-19 at work: health and safety law is fit for purpose. *BMJ*, 375, n3087. doi: 10.1136/bmj.n3087
- Ather, A., Patel, B., Ruparel, N. B., Diogenes, A., & Hargreaves, K. M. (2020). Coronavirus disease 19 (COVID-19): implications for clinical dental care. *Journal of Endodontics*, 46(5), 584–595.
- Blanuša, J., Barzut, V., & Knežević, J. (2021). Intolerance of Uncertainty and Fear of COVID-19 Moderating Role in Relationship Between Job Insecurity and Work-Related Distress in the Republic of Serbia. *Frontiers in Psychology*, 12, 647972. doi: 10.3389/fpsyg.2021.647972
- Carayon, P., Schoofs Hundt, A., Karsh, B. T., Gurses, A. P., Alvarado, C. J., Smith, M., & Flatley Brennan, P. (2006). Work System Design for Patient Safety: the SEIPS Model. *Quality and Safety in Health Care*, 15(1), 150–158.
- Chen, C. C., Zou, S. S., & Chen, M. H. (2022). The fear of being infected and fired: Examining the dual job stressors of hospitality employees during COVID-19. *International Journal of Hospitality Management*, 102.
- Ciarniene, R., Vienazindiene, M., & Vojtovic, S. (2017). Process Improvement for Value Creation: a Case of Health Care Organization. *Inzinerine Ekonomika-Engineering Economics*, 28(1), 79–87.
- Consolo, U., Bellini, P., Bencivenni, D., Iani, C., & Checchi, V. (2020). Epidemiological Aspects and Psychological Reactions to COVID-19 of Dental Practitioners in the Northern Italy Districts of Modena and Reggio Emilia. *International Journal of Environmental Research and Public Health*, 17(10), 3459.

- COVID-19 Lietuvoje [COVID-19 in Lithuania]. Retrieved from <https://experience.arcgis.com/experience/cab-84dcfe0464c2a8050a78f817924ca>
- COVID-19: Occupational health and safety for health workers. Interim guidance 2 February 2021. Retrieved from <https://apps.who.int/iris/handle/10665/339151>
- Czerniawska, M., & Szydło, J. (2020). The Worldview and Values – Analysing Relations. *WSEAS Transactions on Business and Economics*, 17, 594-607. doi: 10.37394/23207.2020.17.58
- Eguchi, H., Hino, A., Inoue, A., Tsuji, M., Tateishi, S., Ando, H., Nagata, T., Matsuda, S., & Fujino, Y. (2021). Effect of Anxiety About COVID-19 Infection in the Workplace on the Association Between Job Demands and Psychological Distress. *Frontiers in Public Health*, 9. doi:10.3389/fpubh.2021.722071
- Eman, E. A. E., Manal, M. A., Abobakr, A. A., & Mervat, M. E. D. (2021). Fear of COVID-19 and Its Impact on Job Satisfaction and Turnover Intention Among Egyptian Physicians. *Safety and Health at Work*, 12(4). doi: 10.1016/j.shaw.2021.07.007
- Gaižauskaitė, I., & Valavičienė, N. (2016). *Socialinių tyrimų metodai: kokybinis interviu*. Vilnius: Registrų centras. Retrieved from <https://repository.mruni.eu/bitstream/handle/007/16724/9789955302056.pdf?sequence=1&isAllowed=y>
- Gasparro, R., Scandurra, C., Maldonato, N. M., Dolce, P., Bochicchio, V., Valletta, A., & Marenzi, G. (2020). Perceived Job Insecurity and Depressive Symptoms among Italian Dentists: the Moderating Role of Fear of COVID-19. *International Journal of Environmental Research and Public Health*, 17, 5338. doi: 10.3390/ijerph17155338
- Ghai, S. (2020). Teledentistry during COVID-19 pandemic. *Diabetology & Metabolic Syndrome*, 14(5), 933-935. doi: 10.1016/j.dsx.2020.06.029
- Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, 292. doi: 10.1016/j.socscimed.2021.114523
- Huang, Y. T., & Rundle-Thiele, S. (2014). The moderating effect of cultural congruence on the internal marketing practice and employee satisfaction relationship: an empirical examination of Australian and Taiwanese born tourism employees. *Tourism Management*, 42, 196-206.
- ILO Policy Brief on COVID-19. Pillar 3: Protecting workers in the workplace. Geneva: International Labour Organization. (2020). Retrieved from https://www.ilo.org/global/topics/coronavirus/impacts-and-responses/WCMS_739049/lang--en/index.htm
- In the face of a pandemic: Ensuring safety and health at work. Geneva: International Labour Organization. (2020). Retrieved from https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_742463.pdf
- Ingram, C., Downey, V., Roe, M., Chen, Y., Archibald, M., Kallas, K.-A., Kumar, J., Naughton, P., Uteh, C. O., Rojas-Chaves, A., et al. (2021). COVID-19 Prevention and Control Measures in Workplace Settings: A Rapid Review and Meta-Analysis. *International Journal of Environmental Research and Public Health*, 18, 7847.
- Jafari, M. J., Saghi, F., Alizadeh, E. et al. (2019). Relationship between risk perception and occupational accidents: a study among foundry workers. *Journal of the Egyptian Public Health Association*, 94, 24. doi: 10.1186/s42506-019-0025-6
- Jahangiri, M., Sareban Zadeh, K., Bashar, O., & Saleh Zade, H. (2013). Investigation risk perception, safety attitude and safety performance in supervisors of construction sites Shiraz-Iran. *Iranian Journal of Ergonomics*, 1, 10-18.
- Kallio, H., Pietila, A., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing*, 72(12), 2954-2965. doi: 10.1111/jan.13031
- Khunti, K., Griffiths, A., Majeed, A., Nagpaul, C., & Rao, M. (2021). Assessing risk for healthcare workers during the covid-19 pandemic. *BMJ*. doi: 10.1136/bmj.n602
- Lee, Y. (2022). How dialogic internal communication fosters employees' safety behavior during the COVID-19 pandemic. *Public Relations Review*, 48-1. doi: 10.1016/j.pubrev.2022.102156
- Liu, D. Z., Gallo, G., Babikow, E., Wiesen, C., Jackson, T. H., Mitchell, K., & Jacox, L. A. (2022). Impacts of the COVID-19 Pandemic on Dentists' Workforce Confidence and Workflow. *The Journal of the American Dental Association*. doi: 10.1016/j.adaj.2021.11.011
- Occupational Safety and Health Administration. Dentistry Workers and Employers. United States department of labor. Retrieved from <https://www.osha.gov/coronavirus/control-prevention/dentistry>
- Seladi-Schulman, J. (2022). Can UV Light Kill the New Coronavirus? Retrieved from <https://www.healthline.com/health/does-uv-kill-coronavirus>
- Shan, B., Liu, X., Gu, A., & Zhao, R. (2022). The Effect of Occupational Health Risk Perception on Job Satisfaction. *International Journal of Environmental Research and Public Health*, 19, 2111. doi: 10.3390/ijerph19042111
- Stangvaltaite-Mouhat, L., Uhlen M.-M., Skudutyte-Rystad, R., Szyszko Hovden, E. A., Shabestari, M., & Ansteinsson, V. E. (2020). Dental Health Services Response to COVID-19 in Norway. *International Journal of Environmental Research and Public Health*, 17(16), 5843.
- Strain, W. D., Jankowski, J., Davies, A., English, P. M. B., Friedman, E., McKeown, H., Sethi, S., & Rao, M. (2021). Development and Presentation of an Objective Risk Stratification Tool for healthcare workers when dealing with the COVID-19 pandemic in the UK: Risk modelling based on hospitalisation and mortality statistics compared to epidemiological data. *BMJ Open*, 11(9), e042225. doi: 10.1136/bmjopen-2020-042225
- Szydło, J., & Grześ-Bukłaho, J. (2020). Relations between National and Organisational Culture – Case Study. *Sustainability*, 12(4), 1522, 1-22. doi: 10.3390/su12041522
- Uhlen, M. M., Ansteinsson, V. E., Stangvaltaite-Mouhat, L. et al. (2021). Psychological impact of the COVID-19

- pandemic on dental health personnel in Norway. *BMC Health Services Research*, 21, 420.
- Vu, T. V., Vo-Thanh, T., Nguyen, N. P., Nguyen, D. V., Chi, H. (2022). The COVID-19 pandemic: Workplace safety management practices, job insecurity, and employees' organizational citizenship behaviour. *Safety Science*, 145. doi: 10.1016/j.ssci.2021.105527
- WHO calls for healthy, safe and decent working conditions for all health workers, amidst COVID-19 pandemic. Geneva: World Health Organization, 28 April 2020. Retrieved from <https://www.who.int/news/item/28-04-2020-who-calls-forhealthy-safe-and-decent-working-conditions-for-all-health-workers-amidst-covid-19-pandemic>
- Žydzūnaitė, V., & Sabaliauskas, S. (2017). *Kokybiniai tyrimai: Principai ir metodai*. Vilnius: VAGA. Retrieved from https://www.academia.edu/31606247/KOKYBINIAI_TYRIMAI_PRINCIPAI_IR_METODAI_Qualitative_Research_Principles_and_Methods_