ABSTRACT

During the Covid-19 pandemic, the Hospital’s Dental Clinic no longer served patients due to concerns about the safety of health workers and patients that contributes to a decrease in hospital revenues. The purpose of this study was to identify the readiness of the Dental Clinic of the Hospital to provide services during the Covid-19 pandemic, as well as to find its possible solutions. The study was conducted at the Hospital in August-September 2020. The research design was descriptive analysis from observation, interviews, and discussion data. Observations were made on the Hospital’s Dental Clinic service system, data, and environment. Unstructured interviews and discussions through the Forum Group Discussion (FGD) were conducted with two dentists, one dental nurse, and the Head of Facilities and Infrastructure of the Hospital to find the problems related to the closure of the Hospital’s Dental Clinic. Identifying potential solutions and determining priority for potential solutions were done by conducting an FGD involving the Deputy Director of Medical Services, Head of Medical Services, Head of Education and Training Division, Head of Facilities and Infrastructure, and Clinical Medical Staff. The results show that during the Covid-19 pandemic, the Hospital is not ready to provide dental services because the hospital has not met the minimum service standards for dental services issued by the Executive Board of the Indonesian Dentist Association. The priority solution to meet the minimum service standards of the Dental Clinic is the procurement of infrastructure by considering economic factors and high functional values.

Keywords: Covid-19, dental clinic, hospital, readiness

ABSTRAK


Kata Kunci: Covid-19, kesiapan, klinik gigi, rumah sakit

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DOI: http://dx.doi.org/10.21776/ub.jkb.2021.031.02.1s
INTRODUCTION

The Covid-19 infection rapidly advanced into a pandemic remarked by the reports of new cases outside China (1), where the initial case was found. At the beginning of 2020, at least 28,276 cases were found in several countries, including China, Thailand, Japan, South Korea, Singapore, Vietnam, Taiwan, Nepal, and America (1). By 24 August 2020, 23 millions cases of Covid-19 had been identified worldwide, with 15 million recoveries and 800,906 deaths (2). The Covid-19 development in Indonesia is also growing significantly. By August 2020, 165,887 positive confirmed cases with 7,169 deaths had been identified (3). East Java became the second-highest case distribution area in Indonesia, with 30,315 positive confirmed cases on 23 August 2020. At the same time, Malang City had 1,061 positive confirmed cases, 643 recovered cases, 84 deaths, and 1,944 suspected Covid-19 cases (4).

Increasing Covid-19 cases in Malang City challenge all health facilities in Malang City, including the Hospital. Until July 2020, in the, one of the Covid-19 referral hospitals in Malang City, had handled 133 confirmed and suspected cases of Covid-19. The Hospital is a type C general hospital located in Malang City and holds full accreditation status from Hospital Accreditation Committee (KARS). One of the outpatient services owned by the hospital that has a high risk of Covid-19 transmission is the Dental Clinic. The Hospital’s Dental Clinic consists of a General Dental Clinic and a Specialist Dental Clinic with four general dentists, one dentist specializing in oral diseases, and one specialist in oral surgery.

Since the Covid-19 outbreak, the Dental Clinic in this Hospital has not opened any services for patients. Two rooms of the Dental Clinic at the hospital have been converted into a resting room for doctors and nurses and as storage of personal protective equipment (PPE) stocks. The interview result conducted with one of the dentists of X Hospital revealed that the decision was made to avoid the transmission and due to the fear of providing services at the Dental Clinic. The main consideration was the absence of a good safety standard system in facing the Covid-19 pandemic. In addition, the hospital had difficulty identifying the items to meet minimum service standards.

Those overall conditions would affect the service delivery and the hospital income. If the situation persists, operational capabilities and compliance with service standards and user demands may also be affected (5). On the other hand, continuing the service with low safety standards can surely increase the risk of Covid-19 transmission between dentists, nurses, and patients (6). The high risk to health workers was also reported by Amnesty International in September 2020 that due to Covid-19, there were more than 7,000 deaths of medical personnel and health workers worldwide (7). On the same day, 104 Indonesian doctors died from Covid-19, and 7 of them were dentists (8–10).

This study aimed to identify the readiness of the Hospital’s Dental Clinic to provide services during the Covid-19 pandemic, as well as to find possible solutions to apply based on the hospital’s capabilities.

METHOD

This research design was descriptive analysis from observations, interviews, and discussions at the Hospital conducted in August-September 2020. Direct observations were made on the service system, data, and environment of the Dental Clinic Hospital. Unstructured interviews were conducted with two dentists, one dental nurse, and the Head of Facilities and Infrastructure. This process was carried out to find problems related to the closure of the X Hospital’s Dental Clinic.

Further, identification of potential solutions and determination of potential solution priorities were carried out by conducting a Forum Group Discussion involving the Deputy Director of Medical Services, Head of Medical Services, Head of Education and Training, Head of Facilities and Infrastructure, and Functional Medical Staff of the Hospital’s Dental Clinic through discussion forum using Zoom Meeting. Identification of potential solutions was set based on the benefits or advantages for Hospital, the effectiveness of solutions that could control the problems and provide added value for Hospital, the ease of solution implementations, and costs. Determining the potential solution priorities was done using the CARL (Capability, Accessibility, Readiness, and Leverage) method. The CARL method is a method used to determine the priority of potential solutions capable of solving problems by multiplying the scores from 4 aspects; capability, accessibility, readiness, leverage (11).

RESULTS

The results of direct observations and interviews show the condition of this Hospital’s Dental Clinic based on the minimum standards of dental clinic services issued by the Executive Board of the Indonesian Dentist Association (PB PDGI) (12). The findings are presented in Table 1.

<table>
<thead>
<tr>
<th>No.</th>
<th>Minimum Standards of Dental Clinic Services According to PB PDGI</th>
<th>X Hospital’s Dental Clinic</th>
<th>Data Collection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Level 3 personal protective equipment</td>
<td>Available</td>
<td>Interview</td>
</tr>
<tr>
<td>2</td>
<td>Room organization by storing all medical tools and materials in drawers or cupboard</td>
<td>Available</td>
<td>Observation and Interview</td>
</tr>
<tr>
<td>3</td>
<td>Equipment sterilization and disinfection according to its type</td>
<td>Available</td>
<td>Observation</td>
</tr>
<tr>
<td>4</td>
<td>One-way clean-dirty airflow</td>
<td>Not available</td>
<td>Observation and Interview</td>
</tr>
<tr>
<td>5</td>
<td>Pathway for medical staff and patients to the dressing or decontamination room so that they do not directly meet other staff or patients</td>
<td>Not available</td>
<td>Observation</td>
</tr>
<tr>
<td>6</td>
<td>Restrictions on dental treatment procedures</td>
<td>Not available</td>
<td>Interview</td>
</tr>
<tr>
<td>7</td>
<td>Standard operating procedures (SOP) for dental treatment procedures</td>
<td>Not available</td>
<td>Interview</td>
</tr>
</tbody>
</table>

Table 1. The condition of the Hospital’s dental clinic based on the minimum standards from the executive board of the Indonesian dentist association (PB PDGI) during the Covid-19 pandemic
Based on Table 1, the Hospital's Dental Clinic has not met the four aspects of the minimum standard of dental clinic services recommended by PB PDGI during the Covid-19 pandemic. The four aspects of minimum standards can be grouped into two groups of problems, the absence of facilities related to dental clinic airflow and the absence of dental clinic service standards that comply with the minimum standards.

The results of the FGD showed potential solutions that the Hospital can follow up to address the problems identified in Table 1. Table 2 shows the sequence of potential solutions according to the analysis using the CARL method.

Based on Table 2, there are three potential solutions for the two problems related to the minimum standard in the Hospital’s Dental Clinic. The main potential solution is the procurement of infrastructure by considering economic factors and functional values.

### DISCUSSION

The Executive Board of the Indonesian Dentist Association (PB PDGI) has made provisions and standards for dental services that all dentists must continue providing services during the Covid-19 pandemic. However, to provide services during the pandemic, a dental clinic must have seven aspects of minimum standards (12), but this Hospital’s Dental Clinic only meets three aspects. If grouped, the Dental Clinic of X Hospital has two problems related to the minimum standards that are (1) the absence of infrastructure related to airflow and (2) the absence of service standards related to the flow of medical officers and patients, restrictions on medical services, and SOPs for service procedures during the Covid-19 pandemic.

Through the CARL method, the priority solution was found for the existing problem on infrastructure procurement by considering economic factors and functional values. These considerations were determined based on the availability of resources (funds, facilities, and infrastructure) owned by X Hospital, the ease of solutions to run, the readiness of the implementing personnel and facilities at X Hospital, and the influence of an aspect on another in solving problems at the X Hospital’s Dental Clinic.

Facility and infrastructure are terms often used in pairs; however, these two words have two different meanings. Facilities are related to rooms that can be used, while infrastructure is related to equipment that can maximize the room’s function to achieve a goal (13). The facilities in this study are related to the Dental Clinic room at X Hospital that can be used to provide services, while the infrastructure is related to assistive equipment that can maximize the function of the Dental Clinic facilities in providing services during the Covid-19 pandemic. In fact, this Hospital already has the facilities to provide dental services during the pandemic, but the hospital does not have the infrastructure to regulate the airflow in the Dental Clinic facilities. This infrastructure has a vital function to prevent the transmission of Covid-19 infection.

The transmission of Covid-19 can occur through liquids (droplets) from the respiratory tract, indirect contact, and through the air (airborne transmissions) that carry virus particles, or aerosols (14,15) The movement of droplets and aerosols is affected by the airflow direction (16,17). Good room ventilation can direct the movement of droplets and aerosols to reduce the amount of virus contained in the treatment room (15,18).

Dentistry has many medical procedures that risk generating aerosols, apart from close contact with saliva and blood (5,14). The use of high or low-speed handpieces, ultrasonic scalers, three-ways syringes, and polishing are the most common aerosols producers in dentistry (20). This Dental Clinic Hospital has not had a good airflow regulation. The lack of infrastructure owned by the Hospital’s Dental Clinic will increase the risk of dentists, dental nurses, or patients to Covid-19 exposure (12,14,20,21). Chen et al., found that the number of droplets and aerosols entering the respiratory zone and the dentist’s body is higher in rooms without exhaust devices (19).

The potential solution prioritized by Hospital is to provide airflow control infrastructure at the Hospital’s Dental Clinic. Jiang et al. found that high ventilation in two hospital buildings reduced the risk of infection among health care workers during the SARS pandemic in Guangdong, China (18). The X Hospital’s Dental Clinic can use mechanical ventilation using a supply system and exhaust system. Mechanical ventilation will produce airflow based on the air movement principle from high to low pressure or from positive pressure to negative pressure so that clean air will enter the room and dirty air will flow out of the room. The room that uses this system is called the negative pressure room, as in the operating room (22,23).

The supply system in mechanical ventilation can be in the form of HVAC (Heating, Ventilating, Air Conditioning) (22,23) It is an air circulation system assembled in one unit by maintaining temperature, humidity, and clean air (22,24). The exhaust system required by the Dental Clinic has special criteria, such as a filtration system and a disinfection system using UV light similar to those found in the operating room (25,26). Thus, the air that comes out of the Dental Clinic through the exhaust is clean and does not

### Table 2. Potential solutions to minimum standard problems of the X Hospital’s Dental Clinic

<table>
<thead>
<tr>
<th>Problems</th>
<th>Potential Solutions</th>
<th>C</th>
<th>A</th>
<th>R</th>
<th>L</th>
<th>Score</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No infrastructure related to dental clinic airflow that meets minimum standards</td>
<td>Infrastructure procurement by considering economic factors and functional value</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>4.032</td>
<td>1</td>
</tr>
<tr>
<td>2. No dental clinic service standards meeting the minimum standards:</td>
<td>- Flow of medical staff and patients</td>
<td>5</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>1.920</td>
<td>3</td>
</tr>
<tr>
<td>- Restriction of medical services</td>
<td>Formulating SOPs according to the service risk category &amp; case restrictions based on existing regulations</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>1.960</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: Capacity, Accessibility, Resources, Leverage
pollute the environment (22,23).

All Dental Clinics certainly expect the procurement of ideal infrastructure, so they can serve all the care needed by patients and minimize the risk of Covid-19 transmission, but this Hospital faces the challenge that this procurement requires large costs. To overcome this, the hospital can provide an economical infrastructure and has a high functional value by modifying the infrastructure.

Modification of the supply system can be done by using a fan or air conditioner (AC) combined with an exhaust fan. The air conditioner must be placed on the wall behind the working operator (dentist and nurse) and not on the ceiling, and the exhaust fan must be placed below within 20 cm of the floor and opposite the air direction from the air conditioner (12,13). It aims to circulate the air entering the room from the air conditioner to the outlet through the exhaust fan and to prevent the air from rotating in the room (12).

Modification of the exhaust system can be applied by using the High-Volume Evacuator (HVE). The HVE is a high-volume exhaust engine with high suction capability over a period of time and is mounted on a system that can pull out ≥ 100 cfm of air volume (12). Two types of HVE available are HVE that is attached directly to the dental unit and portable HVE that is not installed in the dental unit. The HVE that is installed directly on the dental unit utilizes the suction system of the dental unit integrated with the drain line (12,27). This HVE uses a cannula that looks like a small funnel attached to the suction and can be positioned directly close to the tooth being treated. The use of HVE makes the aerosol generated in the process of action can be directly sucked in large volumes (27,28).

The provision of facilities and infrastructure for the Dental Clinic of this Hospital is not enough to stand alone to face the Covid-19 pandemic. The Hospital’s Dental Clinic must also follow up on other potential solutions to meet the recommended service standards. Formulating SOPs for dental services during the Covid-19 pandemic is important by applying the principle of minimizing direct face to face interaction between dentists and patients, and avoiding the possibility of the spread of Covid-19 among health workers and patients (27,29–32). SOP is a guideline to regulate the stages of processes or work procedures to ensure that operational activities run smoothly (30). Alam states that SOPs aim to avoid unwanted events in an activity and assess service quality. Therefore, SOPs are important during the Covid-19 pandemic to avoid transmission of infection (33).

Potential solutions that Hospital can carry out are making SOPs for Dental Clinic services, including the flow of medical personnel, creating action risk categories and case restrictions in accordance with the existing regulations, and creating patient service standards during the Covid-19 pandemic according to the infrastructure available (33). The basic flow of movement of medical personnel adapted with the conditions of X Hospital and the case limitation of the Dental Clinic services at Hospital can refer to the guidelines issued by PB PDGI (12). The SOP preparation for the X Hospital’s Dental Clinic can utilize the Covid-19 Dental Care Pathway initiated by the Office of Chief Dental Officer England (OCDO) (30) and the Safer Aerosol-Free Emergent Dentistry (SAFER Dentistry) made by Benzian and Neiderman (34). The Covid-19 Dental Care Pathway is an integrated dental service concept containing stages of services provided to patients based on evidence-based medical service standards and nursing care with measurable results during the Covid-19 pandemic (12,35,36). The Safer Aerosol-Free Emergent Dentistry (SAFER Dentistry) is a conceptual framework for dental services during the Covid-19 pandemic that prioritizes patient needs, grouping the effective services according to evidence-based and value-based that does not require aerosol-generating actions (34).

This study concludes the Hospital is not ready to provide Dental Clinic services during the Covid-19 pandemic because the hospital has not met the minimum service standards for dental services issued by PB PDGI. The provision of standard-compliant infrastructure and the preparation of service standards focusing on preventing disease transmission are urgently needed by the Dental Clinic of this Hospital (30,32–37).

REFERENCES


32. College of General Dentistry and Faculty of General Dental Practice. FGDP (UK) and CGDent Update towards the 1.pdf. 2020; 3(11): 1.


