

# Factors influencing job satisfaction among dentists during the new normal of the COVID-19 pandemic in Indonesia: A structural equation modeling approach

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## Abstract.

**BACKGROUND:** Dentistry is one of the highest risk occupations that face COVID-19, especially in countries that are severely affected by the pandemic, such as Indonesia.

**OBJECTIVE:** The purpose of the study was to determine factors influencing job satisfaction among dentists during the new normal of COVID-19 pandemic in Indonesia by utilizing the Structural Equation Modeling (SEM) approach.

**METHODS:** A total of 310 Indonesian dentists voluntary completed an online questionnaire, which contained 58 questions. Several latent variables such as perceived severity of COVID-19, staff cooperation and management commitment, personal protective equipment, job stress, working hours, income, and overall job satisfaction were analyzed simultaneously.

**RESULTS:** SEM revealed perceived severity of COVID-19 had significant effects on job stress ( $\beta:0.394, p=0.025$ ) and the utilization of personal protective equipment ( $\beta:0.757, p=0.001$ ). Subsequently, job stress ( $\beta:-0.286, p=0.001$ ), working hours ( $\beta:0.278, p=0.018$ ), income ( $\beta:0.273, p=0.003$ ), personal protective equipment ( $\beta:0.145, p=0.038$ ), and staff cooperation & management commitment ( $\beta:0.091, p=0.002$ ) were found to have significant effects on overall job satisfaction. In addition, management & staff cooperation was found to have a significant association with job stress reduction ( $\beta:-0.319, p=0.003$ ) which subsequently led to higher satisfaction.

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**CONCLUSIONS:** The current study is one of the first that analyzed job satisfaction among dentists in Indonesia during the global COVID-19 pandemic. The integrated latent variables can be applied and extended to evaluate job satisfaction among dentists during the COVID-19 pandemic in other countries. Finally, this study contributed as a theoretical foundation for policymakers to enhance the job satisfaction of dentists during the COVID-19 pandemic.

**Keywords:** Dental macroergonomics, dentist income, job stress, personal protective equipment, health policy

## 1. Introduction

Indonesia is one of the countries that was severely hit by the COVID-19 pandemic. As of June 14, 2021, the COVID-19 pandemic has affected 1,919,547 people, including 53,116 deaths despite 29,869,630 vaccine doses have been administered [1–4]. Ironically, Indonesia was reported as the country with the highest number of death cases of medical workers in Asia with a total of 317 medical doctors, 33 dentists, and 235 nurses have reported deaths as of February 15, 2021 while the number of active cases is continuously growing [5]. The type of transmission in Indonesia is categorized as community transmission, which is a larger outbreak of local transmission [6].

Due to the possible transmission route of exposure to disease and the time interval close contact during activities, dentists are placed to be the highest risk profession who face coronavirus disease 2019 (COVID-19) [7–11]. As of September 22, 2020, a total of 115 dentists were infected in Indonesia. On August 3, 2020, World Health Organization (WHO) released the interim guidance of consideration for the provision of essential oral health services in the context of COVID-19 based on scientific findings. WHO advised to delay oral health care related to non-emergency cases such as check-ups, dental cleanings, and preventive care until COVID-19 transmission was reduced [12]. This situation is a challenge for dentists to perform daily practices.

Along with facing a pandemic situation like this, undergoing dental practice is influenced by the level of job satisfaction of dentists during a pandemic. Some studies showed that the dentist's job satisfaction or quality life can impact job performance in daily practices [13, 14]. Interestingly, Ayers et al. [15] mentioned that there was a significant difference in the level of job satisfaction of male and female dentists. However, despite the availability of many studies related to job satisfaction among dentists [14–29], a very limited study focuses on job satisfaction during the COVID-19 pandemic. Quadri et al. [30] only investigated the awareness of

COVID-19 among dentists in Saudi Arabia. Similarly, Nibali et al. also only investigated the perceived impact of COVID-19 on the periodontal practice in United Kingdom [31]. Several factors during the COVID-19 pandemic such as perceived severity of COVID-19 [32–36], the availability of personal protective equipment (PPE) [37–40], stress [41], and mental health [41, 42] related to COVID-19 may influence job satisfaction among dentist. So, further research is required particularly for enhancing job satisfaction among dentists during the COVID-19 pandemic.

In dental research or dental ergonomics that utilized questionnaires, most studies only applied either ANOVA [31] or regression analysis [28]. These methods require at least three or even more constructs including the mediating variable to test the relationships among constructs [43]. Furthermore, the causal relationships were mainly underexplored. An advanced statistical approach is required to derive the causal relationships between the multivariable and it can be achieved by utilizing structural equation modeling.

Structural equation modeling (SEM) is an advanced statistical method that combined between multiple linear regression and factor analysis simultaneously [43]. In dental research, this method has been utilized by Fenlon and Sherriff [44] to determine factors affecting patients' satisfaction with new complete dentures. In addition, Yamaga et al. [45] also utilized this method for investigating the relationship between oral condition, denture quality, chewing ability, satisfaction with dentures, and oral health-related quality of life (OHRQoL) in complete denture wearers. In public health research, this method also has been performed to evaluate the extended IMB model for exploring the factors influencing health behaviors during COVID-19 [46]. Thus, this method can also be applied in determining factors affecting job satisfaction during the COVID-19 pandemic.

The purpose of this study was to determine factors influencing job satisfaction among dentists during new normal of COVID-19 pandemic in Indonesia

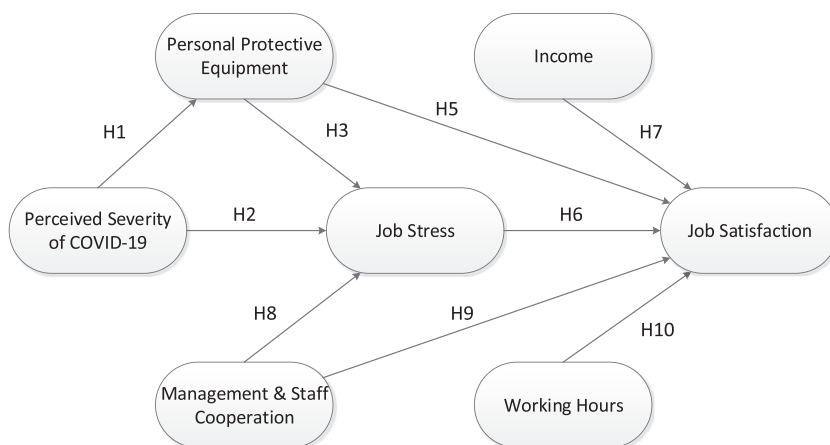


Fig. 1. The proposed model construct in the current study.

by utilizing Structural Equation Modeling (SEM) approach. Several latent variables such as perceived severity of COVID-19, staff cooperation & management commitment, personal protective equipment, job stress [47, 48], working hours, income, and overall job satisfaction were analyzed simultaneously (Fig. 1). The current study is one of the first studies that analyzed job satisfaction among dentists during the global COVID-19 pandemic. The integrated latent variables can be applied and extended to evaluate job satisfaction among dentists during the COVID-19 pandemic in other countries. Finally, this study contributed as a theoretical foundation for policymakers and industry to enhance job satisfaction of dentist during the COVID-19 pandemic.

## 2. Methods

### 2.1. Study participants

A total of 310 dentists between 23 to 54 years old (mean: 27.57, standard deviation: 4.54) voluntarily participated in the current study (Table 1). They were registered in the Indonesian Medical Council and practiced before and/or during the COVID-19 pandemic. Among 310 dentists, a total of 242 (78.1%) were reported still working during the COVID-19 pandemic.

Since the study was conducted during the new normal of the COVID-19 pandemic, an online questionnaire was distributed from August 10, 2020 to October 1, 2020 using convenience sampling method. It was distributed from one dentist to another dentist. Although this study was not required ethical approval,

Table 1  
Socio-demographic characteristics (n = 310)

Characteristics	Category	N	%
Gender	Male	51	16.5
	Female	259	83.5
Age	15–24	32	10.3
	25–34	258	83.2
	35–44	14	4.5
	45–54	6	1.9
Working Experience	<5 years	269	86.8
	5–10 years	24	7.7
	> 10 years	17	5.5
Still Working during COVID-19 pandemic?	Yes	242	78.1
	No	68	21.9

the data were collected anonymous, the confidentiality of the data was guaranteed, and the informed consent was obtained before the subject filled the questionnaire.

### 2.2. Questionnaire

A self-administered questionnaire was developed for this study. It was developed to determine factors influencing job satisfaction among Indonesian dentists during new normal of the COVID-19 pandemic in Indonesia (Table 2). The questionnaire consisted of 9 sections: (1) informed consents, (2) general characteristics of respondents (gender, age, years of practices, and practice during the COVID-19 pandemic or not), (3) perceived severity of COVID-19, (4) job stress, (5) personal protective equipment, (6) management of health services & staff cooperation, (7) income, (8) working hours, and (9) overall dentist job satisfaction. All latent were measured by a 5-point Likert scale.

Table 2  
The constructs and measurement items

Construct	Items	Measures	Supporting References
Perceived Severity of COVID-19	PS1	I find COVID-19 is a serious disease	Bashirian et al., 2020 <sup>32</sup> Prasetyo et al., 2020 <sup>34</sup>
	PS2	I find COVID-19 can lead to death	Bashirian et al., 2020 <sup>32</sup> Prasetyo et al., 2020 <sup>34</sup>
	PS3	I find COVID-19 is more severe than any other diseases	Bashirian et al., 2020 <sup>32</sup> Prasetyo et al., 2020 <sup>34</sup>
	PS4	I think the COVID-19 outbreak will continue at least until the following 3 months	Cássaro & Pires, 2020 <sup>36</sup>
	PS5	I think the COVID-19 outbreak in my country is more severe than in other countries	Prasetyo et al., 2020 <sup>34</sup>
	PS6	I think it will be serious if I contract COVID-19 due to my work	Yıldırım & Güler, 2020 <sup>33</sup>
	PS7	I think dental practice is a high risk of COVID-19 infection	Rongo et al., 2020 <sup>48</sup>
Job Stress	S1	Dentistry is a very stressful profession	Cui et al., 2017 <sup>22</sup>
	S2	Doing dentistry in this COVID-19 pandemic is very stressful for me	Cui et al., <sup>22</sup>
	S3	Concern about the risk of contracting stressed me out during the COVID-19 pandemic	Stefani et al., 2020 <sup>39</sup>
	S4	The fear of professional risks that could affect my health condition during the COVID-19 pandemic stressed me out	Tysiac-Mista & Dziedzic, 2020 <sup>38</sup>
	S5	The fear of the health risks my family members can experience during the COVID-19 pandemic stresses me out	Tysiac-Mista & Dziedzic, 2020 <sup>38</sup>
	S6	I feel stressed by the news that my colleague has died from COVID-19	Grover et al., 2020 <sup>42</sup>
	S7	I am not confident treating a suspected case of COVID-19	Stefani et al., 2020 <sup>39</sup>
	S8	Overall, I feel stressed with my job being a dentist especially in this COVID-19 pandemic	Roth et al., 2004 <sup>29</sup>
Personal Protective Equipment (PPE)	PPE1	I got the latest information about PPE that is better during the COVID-19 pandemic	Houghton et al., 2020 <sup>37</sup>
	PPE2	I work in a sufficiently equipped dental office during the COVID-19 pandemic	Tysiac-Mista & Dziedzic, 2020 <sup>38</sup>
	PPE3	My job poses demands with having the right equipment and resources during the COVID-19 pandemic	Mijiritsky et al., 2020 <sup>47</sup>
	PPE4	The availability of PPE is a serious concern during the COVID-19 pandemic	Houghton et al., 2020 <sup>37</sup>
	PPE5	Additional training of donning and doffing PPE is a must for health workers	Tabah et al., 2020 <sup>40</sup>
	PPE6	Wearing PPE according to guidelines related to a dental practice in a COVID-19 pandemic situation feels comfortable	Houghton et al., 2020 <sup>37</sup>
	PPE7	Overall, wearing PPE makes me feel safe when the COVID-19 pandemic is still ongoing	Houghton et al., 2020 <sup>37</sup>
Management of Health Services & Staff Cooperation	M1	The management instructed me to continue my dental practice since the beginning of the COVID-19 outbreak	Tysiac-Mista & Dziedzic, 2020 <sup>38</sup>
	M2	I feel the management of health care support my work by setting the facility based on the guideline of practices	Houghton et al., 2020 <sup>37</sup>
	M3	The management gives the fair benefits package for the staffs relating the situation of COVID-19 pandemic	Houghton et al., 2020 <sup>37</sup>
	M4	The management ensure my safety and health during the COVID-19 pandemic	Houghton et al., 2020 <sup>37</sup>
	M5	The management gives me and other staffs training opportunity of protection against the COVID-19 pandemic	Houghton et al., 2020 <sup>37</sup>
	M6	I have the same value with management about the protection of staffs in the COVID-19 pandemic	Houghton et al., 2020 <sup>37</sup>
	M7	Overall, the managers of the health care services I work is competent to manage the staffs in the COVID-19 pandemic situation	Houghton et al., 2020 <sup>37</sup>
	SC1	The number of staff in my practice is sufficient to serve patients during the COVID-19 pandemic	Temesgen et al., 2018 <sup>20</sup>

(Continued)

Table 2  
(Continued)

Construct	Items	Measures	Supporting References
	SC2	The quality of staff that I work with is responsive to the issue of the COVID-19 pandemic	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	SC3	The staff I work with is excellent in serving patients during the COVID-19 pandemic	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	SC4	All staff are working well together in dealing with the COVID-19 pandemic	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	SC5	Good staff knowledge regarding COVID-19 supports teamwork during the pandemic	Houghton et al., 2020 <sup>37</sup>
	SC6	All staff continue to respect each other in providing practical services during the COVID-19 pandemic	Harris et al., 2009 <sup>25</sup>
	SC7	I feel motivated to create a nice atmosphere among staff in the practice during the COVID-19 pandemic	Harris et al., 2009 <sup>25</sup>
Income	I1	My income allows me to provide very well for my family since the COVID-19 pandemic	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	I2	The income I receive from this job is much higher than I desire due to the COVID-19 pandemic situation	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	I3	The income that I receive from my job is most satisfactory for my needs although in the COVID-19 pandemic situation	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	I4	My income is comparable to other dentists during the COVID-19 pandemic	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	I5	My income is comparable to other professions during the COVID-19 pandemic	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	I6	My financial situation allowed me not to continue my practice during the COVID-19 pandemic	Tysiac-Mista & Dziedzic, 2020 <sup>38</sup>
	I7	My financial situation allowed me to suspend my practice until the number of COVID-19 cases started to decline	Tysiac-Mista & Dziedzic, 2020 <sup>38</sup>
Working Hours	WH1	The amount of work time available to me is sufficient to be able to provide services to every patient during the COVID-19 pandemic	Mijiritsky et al., 2020 <sup>47</sup>
	WH2	I can do my job well in the COVID-19 pandemic situation	Mijiritsky et al., 2020 <sup>47</sup>
	WH3	I can flexibly schedule my job in the COVID-19 pandemic situation	Sasso et al., 2015 <sup>28</sup>
	WH4	I could have the opportunity to do other professions besides dentistry during the COVID-19 pandemic	Sasso et al., 2015 <sup>28</sup>
	WH5	I can have a weekend off during the COVID-19 pandemic	Sasso et al., 2015 <sup>28</sup>
	WH6	I can schedule my weekends off flexibly during the COVID-19 pandemic	Sasso et al., 2015 <sup>28</sup>
	WH7	I have enough time for my personal life during the COVID-19 pandemic	Sasso et al., 2015 <sup>28</sup>
Job Satisfaction	JS1	Dentistry fulfills my current career aspirations	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	JS2	I appear more satisfied with my job than I am even in the COVID-19 pandemic situation	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	JS3	Dentistry is the place where I can make my best contribution in this COVID-19 pandemic	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	JS4	I feel fortunate to be a dentist in the COVID-19 pandemic situation	Fahim, 2013 <sup>16</sup> Jeong et al., 2006 <sup>17</sup>
	JS5	Facing this pandemic situation, I won't drop my job to do something else	Jeong et al., 2006 <sup>17</sup>
	JS6	I would make the same decision to go into dentistry again although I have to face this COVID-19 pandemic situation	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	JS7	If my child were interested in dentistry, I would encourage him/her to pursue a dental career although she/he has to face this COVID-19 pandemic situation	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>
	JS8	Overall, I am extremely satisfied with my career as a dentist	Cui et al., 2017 <sup>22</sup> Jeong et al., 2006 <sup>17</sup>

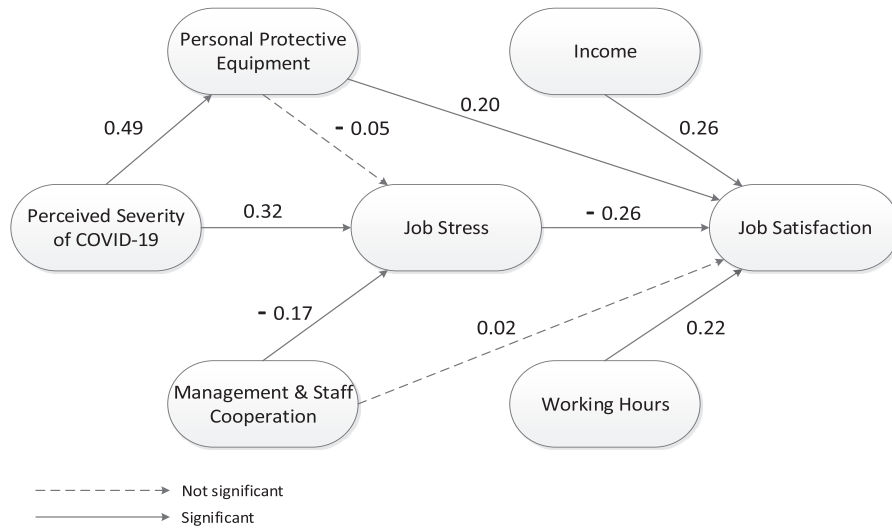


Fig. 2. The preliminary model.

### 2.3. Structural equation modeling (SEM)

SEM was computed by utilizing AMOS 24 with the Maximum Likelihood estimation approach. The Maximum Likelihood estimation approach was selected since it can derive the parameter estimates in a model by utilizing all information in the sets of equations simultaneously [49]. This approach is more advanced than the hierarchical regression since all the hypotheses construct can be analyzed simultaneously. The hypotheses construct had 7 latent variables including 4 exogenous latent variables (perceived severity of COVID-19, management & staff cooperation, income, and working hours) and 3 endogenous latent variables (personal protective equipment, job stress, and job satisfaction).

Following some previous studies that utilized SEM approach [44, 45, 50, 51], 7 indexes were selected to access the model fit: (1) chi-square to degrees of freedom (CMIN/DF), (2) Goodness of Fit Index (GFI), (3) Adjusted Goodness of Fit Index (AGFI), (4) Root Mean Square Error of Approximation (RMSEA), (5) Incremental Fit Index (IFI), (6) Tucker Lewis Index (TLI), (7) Comparative Fit Index (CFI). A value lower than 2.00 for CMIN/DF is widely known as the minimum cut-off for a good model fit [43]. In addition, a value of higher than 0.80 is also a good cut-off for model fit for GFI and AGFI [52]. Similarly, a value of greater than 0.90 for IFI, CFI, TLI was also considered as a good fit [43]. Finally, a value of lower than 0.07 was considered as a good fit for RMSEA [53, 54].

### 3. Results

Figure 2 demonstrates the preliminary model of the current study. Based on this figure, there were two insignificant paths: PPE → job stress ( $\beta:0.05, p=0.743$ ), management & staff cooperation → job satisfaction ( $\beta:0.02, p=0.882$ ). A final model was derived by eliminating these two paths. In addition, as suggested by Hair [43], the factor loading of each indicator should be higher than 0.5 to make sure the quality of the indicators. Based on Table 3, 17 out of 58 indicators were eliminated since the factor loadings were lower than 0.5, including PS3, PS4, PS5, MS1, MS3, PPE5, PPE6, PPE7, S7, WH4, WH5, WH6, WH7, I6, I7, OS1, and OS2. In addition, following some of our previous studies that utilized SEM approach [34], some modification indices were also applied to enhance the model fit.

Figure 3 demonstrates the final SEM of factors influencing job satisfaction among dentist during new normal of COVID-19 pandemic. In addition, Tables 4 and 5 represent the model fit and the direct, indirect, total effects respectively. Based on Table 4, CMID/DF value was 1.739, which was lower than the suggested cut-off of 2.00. The GFI and AGFI values were 0.843 and 0.816 respectively which were higher than the suggested cut-off of 0.8. Similarly, The IFI, TLI, and CFI values were higher than 0.9, indicating that the model is a good representation of the data. Finally, the RMSEA value was also lower than the suggested cut-off of 0.07.

Table 3  
Descriptive statistic results

Factor	Item	Mean	StDev	Factor Loading	
				Initial Model	Final Model
Perceived Severity of COVID-19	PS1	4.82	0.498	0.662	0.605
	PS2	4.80	0.499	0.675	0.613
	PS3	3.76	0.885	0.420	–
	PS4	4.59	0.636	0.380	–
	PS5	4.21	0.864	0.295	–
	PS6	4.78	0.514	0.726	0.525
	PS7	4.77	0.542	0.740	0.583
Management of Health Services & Staff Cooperation	MS1	2.97	1.238	–0.026	–
	MS2	4.04	0.961	0.545	0.565
	MS3	3.08	1.273	0.495	–
	MS4	3.58	1.126	0.566	0.557
	MS5	3.24	1.254	0.451	–
	MS6	3.71	1.054	0.574	0.549
	MS7	3.60	0.983	0.581	0.565
	SC1	3.79	0.953	0.616	0.678
	SC2	3.90	0.887	0.819	0.844
	SC3	3.97	0.812	0.838	0.856
	SC4	4.03	0.788	0.872	0.914
	SC5	4.16	0.776	0.695	0.640
	SC6	4.29	0.716	0.745	0.693
	SC7	4.39	0.687	0.555	0.538
Personal Protective Equipment (PPE)	PPE1	4.35	0.739	0.556	0.581
	PPE2	3.82	1.04	0.500	0.633
	PPE3	4.65	0.602	0.671	0.644
	PPE4	4.78	0.512	0.614	0.655
	PPE5	4.80	0.510	0.452	–
	PPE6	3.31	1.383	0.300	–
	PPE7	4.36	0.859	0.495	–
Stress	S1	3.13	1.277	0.570	0.555
	S2	3.51	1.151	0.820	0.801
	S3	3.79	1.100	0.875	0.870
	S4	3.57	1.094	0.913	0.911
	S5	3.89	1.054	0.871	0.865
	S6	3.91	1.025	0.770	0.773
	S7	4.14	1.005	0.414	–
	S8	3.53	1.151	0.834	0.835
Working Hours	WH1	3.76	0.838	0.729	0.740
	WH2	3.37	1.061	0.733	0.761
	WH3	3.71	1.024	0.739	0.749
	WH4	3.35	1.096	0.229	–
	WH5	3.78	1.103	0.290	–
	WH6	3.51	1.190	0.252	–
	WH7	4.08	0.992	0.263	–
Income	I1	3.06	1.09697	0.769	0.776
	I2	2.17	1.00901	0.774	0.785
	I3	2.59	1.07208	0.897	0.921
	I4	2.65	0.94625	0.736	0.686
	I5	2.49	0.99752	0.699	0.638
	I6	2.62	1.11053	0.221	–
	I7	2.75	1.16775	0.192	–
Overall Satisfaction	OS1	4.10	0.83743	0.498	–
	OS2	3.56	0.89286	0.441	–
	OS3	3.32	1.04547	0.685	0.656
	OS4	2.93	1.11375	0.690	0.670
	OS5	3.46	1.02889	0.773	0.749
	OS6	3.76	0.96350	0.745	0.712
	OS7	3.11	1.24671	0.548	0.511
	OS8	3.75	0.97438	0.707	0.695

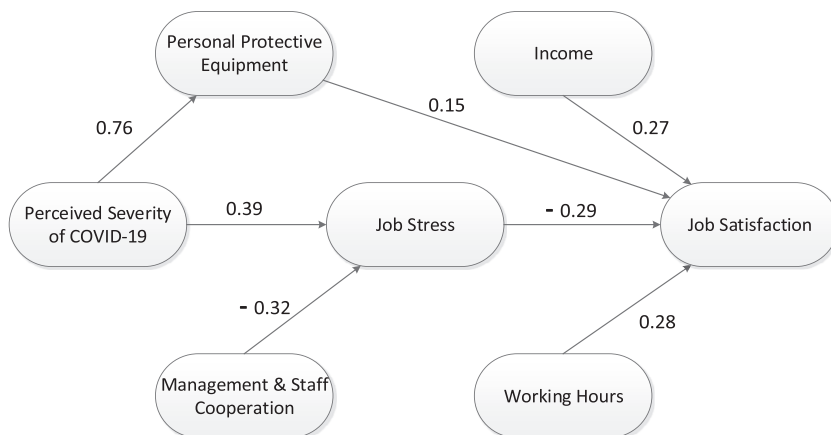


Fig. 3. The final SEM of factors influencing job satisfaction among dentist during new normal of COVID-19 pandemic.

Table 4  
Model fit

Goodness of fit measures of the CFA	Parameter Estimates		Suggested cut-off	Recommended by
	Initial	Final		
<b>Absolute Fit Indices</b>				
CMIN/DF	2.840	1.739	< 2.00	Hair (2010) <sup>43</sup>
Goodness of Fit Index (GFI)	0.648	0.843	> 0.80	Gefen et al., (2000) <sup>52</sup>
Adjusted Goodness of Fit Index (AGFI)	0.619	0.816	> 0.80	Gefen et al., (2000) <sup>52</sup>
Root Mean Square Error of Approximation (RMSEA)	0.077	0.049	< 0.07	Steiger., (2007) <sup>53</sup>
<b>Incremental Fit Indices</b>				
Incremental Fit Index (IFI)	0.692	0.928	> 0.90	Hair (2010) <sup>43</sup>
Tucker Lewis Index (TLI)	0.675	0.919	> 0.90	Hair (2010) <sup>43</sup>
Comparative Fit Index (CFI)	0.690	0.928	> 0.90	Hair (2010) <sup>43</sup>

Table 5  
Direct, Indirect, and Total Effects

No	Variables	Direct effect	P value	Indirect effect	P value	Total effect	P value
1	PS → PPE	0.757	0.001	–	–	0.757	0.001
2	PS → S	0.394	0.025	–	–	0.394	0.025
3	PS → OS	–	–	–0.003	0.856	–0.003	0.856
4	PPE → OS	0.145	0.038	–	–	0.145	0.038
5	MSC → S	–0.319	0.003	–	–	–0.319	0.003
6	MSC → OS	–	–	0.091	0.002	0.091	0.002
7	S → OS	–0.286	0.001	–	–	–0.286	0.001
8	I → OS	0.273	0.003	–	–	0.273	0.003
9	WH → OS	0.278	0.018	–	–	0.278	0.018

#### 4. Discussion

According to SEM results, the perceived severity of COVID-19 among dentists had a significant effect on PPE ( $\beta:0.757, p=0.001$ ) and job stress ( $\beta:0.394, p=0.025$ ). A study conducted by Wahed et al. [35] found that risk perceptions of COVID-19 were high due to the fear of transmitting the

disease not only to them but also to their family. New guideline of COVID-19 prevention was announced to dentists, especially PPE procedure, due to high possibility transmission in dental practices [12]. This guideline also forced dentists to perform additional cleaning as stated by Houghton et al. [37]. Moreover, as supported by Tysiac-Mista et al. [38], this study suggests the coordination of health services related



to the COVID-19 pandemic regarding the availability of PPE should be done when dentists performed their daily practices.

Regarding job stress, our study was in line with Martina et al. [48] that showed dentists considered their job as a high risk to them and their families. Thus, most dentists were scared to return the daily practices. Performing daily practices was a source of anxiety among dentists during large-scale social restriction of the COVID-19 pandemic [48]. Grover et al. [42] explained in their study that research should be focused on the impact of the COVID-19 pandemic among health workers' mental health. Furthermore, mental health professionals should emphasize that mental health goes hand in hand with physical health in this situation [42].

PPE is a widely discussed issue since this COVID-19 pandemic has begun. The current study showed that PPE in the COVID-19 pandemic had an insignificant effect on job stress. However, Houghton et al. [37] mentioned that a lack of PPE, uncomfortable to use PPE, and feeling isolated and frightened by patients might become a serious concern for dentists. Tysiac-Mista et al. [38] also showed that a lack of PPE led to an overwhelming feeling of fear and anxiety among dental professionals. Moreover, using PPE tends to feel extreme exhaustion as explained by Turkoglu et al. [40].

The current study showed that job stress, working hours, income, and PPE were the main factors influence job satisfaction among dentists during new normal of the COVID-19 pandemic. Based on the SEM results, working hours ( $\beta:0.278$ ,  $p=0.018$ ), income ( $\beta:0.273$ ,  $p=0.003$ ), and PPE ( $\beta:0.145$ ,  $p=0.038$ ) had significant positive effects on job satisfaction whereas job stress had a significant negative effect on job satisfaction ( $\beta:-0.286$ ,  $p=0.001$ ). It could be interpreted that adjusting the working hours, income, PPE, and controlling the possible factors that affect stress during this COVID-19 pandemic should be done by the stakeholder for improvement of job satisfaction among dentists.

Interestingly, this study showed that income found to be one of the most significant factors in job satisfaction. This result was similar to several studies [19, 21–23, 29] that showed income as a significant determinant of job satisfaction. According to Sasso et al. [28], dentists working in a large group setting are more satisfied with income and benefit than the dentist in solo practice. Benefit packages received by the dentists in a large group setting may impact their job satisfaction level [18].

SEM indicated that working hours significantly affect job satisfaction among dentists during new normal of the COVID-19 pandemic. This finding was supported by K. Goetz et al. [23] that working hours are one of the significant factors that affect overall job satisfaction among dentists. In line with this study, Luzzi and Spencer [14] also stated the flexible working hours of dentists may improve their job satisfaction. Slightly different from the existing study explained before, Al-Buainain et al. [24] found that the possibility to take an opportunity for part-time work besides daily practices affects the least job satisfaction among dentists.

PPE is the job satisfaction factor that has been found by the current study among Indonesian dentists during new normal of the COVID-19 pandemic. As explained by Zhang et al. [41], the importance of physical protection led to access to PPE become job satisfaction factors among health workers in Iran during the COVID-19 pandemic. Our study had completed the previous studies [54–58] by providing an overview of job satisfaction among Indonesian dentists that were affected by the PPE factor.

Regarding the job stress, this study showed a significant negative effect on job satisfaction. This result was similar to a study conducted by Roth et al. [29] and Cui et al. [22]. Moreover, Purine et al. [26] and Ab-Murat et al. [59] explained that dentists experience different kind of mental health impairments such as nervousness, physical burnout [58], anxiety, depression, sleeplessness, lack of self-esteem, and loneliness in their daily practices [26, 59]. This finding showed that stress and other mental health impairments threaten the mental health of dentists in their daily practices that may affect their job satisfaction. We suggest that preventive measures should be taken to reduce stress-causing factors for dentists during the COVID-19 pandemic.

Finally, regarding the management and staff cooperation of the health services factor, our study found this factor had a low significant indirect effect on job satisfaction ( $\beta:0.091$ ,  $p=0.002$ ). Meanwhile, this factor had a significant negative direct effect to job stress ( $\beta:-0.319$ ,  $p=0.003$ ). Although this finding differs from Roth et al. [29] and Sasso et al. [28], it could be interpreted that the stakeholder should pay attention to the management and staff cooperation of health services, so that it improves job satisfaction among dentist by reducing the job stress factor among dentists during new normal of COVID-19 pandemic [60].

Despite the high novelty and substantial contribution of the study, we would like to acknowledge several limitations about the current study's findings. First, our study assumed that the dentists were under homogenous institutions, in fact, dentists can work either in the hospital, clinic, or even in a small public health center. Future research to examine the effect of the institutions to the overall satisfaction would be a good research topic. Second, the respondents were not under the same province or city. Different provinces or cities could lead to a different level of perceived severity of COVID-19. In Indonesia, several provinces are under the green zone which means that the local transmission is less severe. Last but not the least, the current study selected six main factors as the main contributing factors to job satisfaction. In fact, there are several more factors that can influence the job satisfaction among dentists such as relationships with patients, the government supports, and even the existence of health insurance [61, 62]. Future research that incorporates these latent variables in the SEM would be a very promising research topic.

## 5. Conclusion

COVID-19 is a global crisis in 2020 [61]. In Indonesia, a total of 117 dentists were infected by COVID-19 as of September 29, 2020. Ironically, 33 dentists were passed away due to COVID-19 as of February 15, 2021 [5] and the numbers could be higher since Indonesia is one of the countries that seriously hit by COVID-19 pandemic.

The purpose of the study was to determine factors influencing job satisfaction among Dentist during new normal of COVID-19 pandemic in Indonesia by utilizing Structural Equation Modeling (SEM) approach. Several latent variables such as perceived severity of COVID-19, staff cooperation & management commitment, personal protective equipment, stress, working hours, income, and overall satisfaction were analyzed simultaneously. A total of 310 dentists from Indonesia were voluntarily filled an online questionnaire, which contained 58 questions. SEM indicated that perceived severity of COVID-19 had significant effects on job stress ( $\beta:0.394$ ,  $p=0.025$ ) and personal protective equipment ( $\beta:0.757$ ,  $p=0.001$ ). Subsequently, working hours ( $\beta:0.278$ ,  $p=0.018$ ), income ( $\beta:0.273$ ,  $p=0.003$ ), and PPE ( $\beta:0.145$ ,  $p=0.038$ ) had significant positive effects on job satisfaction whereas job stress had a significant negative effect on job

satisfaction ( $\beta:-0.286$ ,  $p=0.001$ ). In addition, management & staff cooperation was found to have a significant association with job stress reduction ( $\beta:-0.319$ ,  $p=0.003$ ) which subsequently led to higher satisfaction. Interestingly, working hours and income were found to have the highest effect on overall satisfaction indicating that the policymakers should concern more on these two factors in order to enhance the job satisfaction among dentists in Indonesia.

The current study is one of the first studies that analyzed the job satisfaction among dentist during the global COVID-19 pandemic in Indonesia. The integrated latent variables can be applied and extended to evaluate the job satisfaction among dentists during the COVID-19 pandemic in other countries. Finally, this study contributed as a theoretical foundation for policymakers to enhance the job satisfaction of dentists during the COVID-19 pandemic.

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## Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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