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The mental workload of primary healthcare workers during a covid-19 pandemic

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A B S T R A C T

Public health centre plays a role in monitoring the implementation of prevention, detection, and response to the COVID-19 pandemic at the individual, family, and community level. This situation may have impacts on the workload for health care workers (HCWs). Thus, HCWs are at a high risk of experiencing severe mental problems due to increased exposure to the coronavirus, separation from family, and unclear situations.The study aims to explore the mental workload of health care workers during the novel coronavirus disease 2019 (COVID-19) pandemic. NASA-TLX has been used to measure the mental workload of 55 HCWs at the public health centre and distributed directly to them between March and April 2021. Mental workload of HCWs was high (70.7 ± 11.4). The most important dimensions of mental workload were "mental demand" (15.4 ± 5.9), and "physical demand" (12.9 ± 6.7). Among HCWs, midwife had the highest workload (74.1 ± 9.5). Males had higher scores of mental workload compared to females (17.6 ± 6.3 vs. 14.4 ± 5.5). However, females had higher scores of frustration than males (6.6 ± 6.4 vs. 4.9 ± 5.4). Health workers who worked in emergency unit had higher scores of mental and physical demand compared to the poly unit (19.9 ± 5.2; 13.9 ± 7.6 vs. 14.2 ± 5.7; 13.0 ± 6.4). A significant correlation was observed between mental demand and the work unit (r = -0.35, p = 0.009). This study suggests that attention should be paid to the psychological well-being of HCWs. Mental support and intervention need to be taken by the government or related parties to reduce mental workload of health workers during the COVID-19 pandemic

Kata kunci:

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A B S T R A K

Puskesmas berperan dalam pemantauan pelaksanaan pencegahan, deteksi, dan penanggulangan pandemi COVID-19 di tingkat individu, keluarga, dan masyarakat. Situasi ini tentunya berdampak pada beban kerja para petugas kesehatan yang bertugas di Puskesmas. Dengan demikian, petugas kesehatan berisiko tinggi mengalami masalah mental yang parah akibat peningkatan paparan virus corona, perpisahan dari keluarga, dan situasi yang tidak jelas. Penelitian ini bertujuan untuk mengeksplorasi beban kerja mental petugas kesehatan selama pandemi novel coronavirus 2019 (COVID-19). NASA-TLX telah digunakan untuk mengukur beban kerja mental 55 petugas kesehatan di Puskesmas dan didistribusikan secara langsung kepada responden pada bulan Maret – April 2021. Hasil penelitian menunjukkan bahwa petugas kesehatan memiliki beban kerja mental yang tinggi (70,7 ± 11,4). Dimensi yang memiliki skor tinggi dari beban kerja mental adalah "tuntutan mental" (15,4 ± 5,9), dan "tuntutan fisik" (12,9 ± 6,7). Di antara petugas kesehatan, bidan memiliki beban kerja tertinggi (74,1 ± 9,5). Laki-laki memiliki skor beban kerja mental yang lebih tinggi

dibandingkan dengan perempuan (17,6 ± 6,3 vs 14,4 ± 5,5). Namun, perempuan memiliki skor frustrasi yang lebih tinggi daripada laki-laki (6,6 ± 6,4 vs 4,9 ± 5,4). Tenaga kesehatan yang bekerja di unit gawat darurat memiliki skor tuntutan mental dan fisik yang lebih tinggi dibandingkan dengan unit poli (19,9 ± 5,2; 13,9 ± 7,6 vs 14,2 ± 5,7; 13,0 ± 6,4). Ada hubungan yang signifikan antara tuntutan mental dan unit kerja (r = -0,35, p = 0,009). Penelitian ini mengindikasikan bahwa perlu adanya perhatian terkait kesejahteraan psikologis bagi petugas kesehatan. Dukungan sosial dan intervensi mental perlu dilakukan oleh pemerintah atau pihak terkait untuk mengurangi beban kerja mental tenaga kesehatan di masa pandemi COVID-19

INTRODUCTION

Covid-19 has been announced as a pandemic since March 2020 in Indonesia and it is still going on up to now. Data of the Covid-19 National Task Force recorded 1.577.526 confirmed cases on 13th April 2021 and 42.782 death cases with Case Fatality Rate (CFR) of 2.7% (Kementrian Kesehatan RI, 2021). Based on such calculations, Indonesia ranks 18th in the world with the most confirmed cases (Worldometer, 2021). The confirmed cases have not decreased significantly. There are at least 3000 – 5000 confirmed cases each day.

The government of Indonesia has made some efforts to prevent the spread of Covid-19 by applying Social Distancing policy and Large-Scale Social Distancing. Yet, the policies have not proved effective in reducing Covid-19 cases in Indonesia (Putri, 2020). Mass media promotions in terms of TV advertisements, billboards and pamphlets containing campaigns to raise people's awareness in an attempt to avoid the virus spread have not shown a high success rate either. Therefore, health care workers' involvement in primary health facilities becomes an important point as the front line in the fight against Covid-19.

Public Health Center as a basic health care provider aims to improve the community's health status in the work area. In this pandemic situation, Public Health Center plays a role in monitoring the implementation of prevention, detection and response to the Covid-19 pandemic at the individual, family and community level (Saraswati, 2020). Health care workers in Public Health Centers surely get extra burden so these professional health care workers are at a high risk of experiencing more severe mental problems due to increased exposure to corona virus, separation from family, unclear situation, fear of contagion and minimum facilities in treating patients (Rosyanti & Hadi, 2020).

The high rate of contagion and death due to Covid-19 to health care workers can be psychological stress to health professionals. Data recorded that in January 2021, 647 health care workers: 283 doctors, 27 dentists, 221 nurses, 84 midwives, 11 pharmacists and 15 laboratory workers died due to Covid-19. The number is recorded the highest number of health workers death in Asia (Arnani & Hardiyanto, 2021).

A study on relationship between health care workers' workload and mental health in Iran showed that health care workers experienced higher mental pressure due to Covid-19 pandemic (15.42±4.25) compared to the physical pressure they were facing (Shoja et al., 2020). Furthermore, a study on relationship between nurses' workload and mental pressure in the fight against Covid-19 showed a mean value of mental workload of 65.90. The value means that the mental workload that nurses experienced was pretty high (Shan et al., 2021). If this problem is not handled well, more severe mental health problems can develop, such as post-traumatic stress disorder, clinical depression, and repeated alcohol use in health care workers (Rosyanti & Hadi, 2020)

METHOD

Participant characteristics and research design

A cross-sectional design was established, which involved a random sample of 55 health care workers from Public Health Centers in Yogyakarta area. Public health workers who participated in this study were: doctors, nurses, midwives, pharmacists and others. The data was collected during March to April 2021. The inclusion criteria in this study include:

1) Health workers based on Permenkes number 43 year 2019
2) Health workers who are not on sick leave
3) Willing to participate and comply with the procedures in the research

Sampling procedures

The population in this study were health workers of primary health services (Puskesmas). Simple random sampling was used as a sampling technique calculated using the formula for correlation study with the $Z\alpha$ value of 1.96, $Z\beta$ of 0.84 and the value of r was set at 0.4, so the minimum samples for this study was 47 respondents.

Measures

The measurement of mental workload was implemented using NASA-TLX questionnaire which has been translated into Indonesian language. NASA-TLX measures mental workload based on 6 dimensions: mental demands, physical demands, temporal demands, performance, efforts, and frustration. The questionnaire has been validated through item validity test and reliability test using Cronbach Alpha with the value result of 0.709.

Data analysis

The data were presented in form of statistical descriptive in terms of frequency, percentage, mean and SD to depict characteristics of respondents and mental workload. In addition, the researchers also used Spearman correlation

analysis to know the relationship among variables in the study.

RESULTS AND DISCUSSION

Characteristics of Participants

The majority of participants were female (79.1%). They are between 21 – 40 years old (74.5%) and have work experience for less than 12 years (69.1%). Generally, participants worked in poly units/outpatient unit as a nurse, a doctor, or a midwife (see table 1).

Table 1.
Demographic characteristics of participants

Characteristics	Number (%)
Gender	
Male	17 (30.9)
Female	38 (69.1)
Age in year	
21 – 30	19 (34.5)
41 – 40	22 (40.0)
41 – 50	4 (7.3)
>50	10 (18.2)
Work experience (year)	
1 – 6	25 (45.5)
7 – 12	13 (23.6)
13 – 18	3 (5.5)
>18	14 (25.5)
Job	
Doctor	9 (16.4)
Nurse	16 (29.1)
Midwife	9 (16.4)
Lab and/ pharmacist	10 (18.2)
Other	11 (20.0)
Unit of work	
Emergency/ inpatient unit	13 (23.6)
Poly/ outpatient	23 (41.8)
Laboratory and/ or pharmacy	10 (18.2)
Other	9 (16.4)

Mental workload of health care workers

In this study, the total mean score of mental workload was 70.7 (SD 11.4), which indicates a high level of mental workload. Mental demands has the highest mean score compared to other dimensions, followed by physical demands (see table 2). Both females and males had high level of mental workload. However, males had higher mental demands than females, while females had higher scores of frustration than males (6.6 ± 6.4 vs. 4.9 ± 5.4) (see table 3).

Table 2.
Subscale score of NASA-TLX on HCWs

Variable	Min	Max	Mean	SD
Mental demands	2.7	30.0	15.4	5.9
Physical demands	0.0	26.7	12.9	6.7
Temporal demands	0.0	33.3	12.3	7.4
Performance	0.0	26.7	12.5	7.3
Effort	0.0	30.0	11.5	7.5
Frustration	0.0	21.3	6.1	6.1
Total			70.7	11.4

Table 3.
Mean mental workload score between the male and female

Variable	Female (n=38)	Male (n=17)
Mental demands	14.4±5.5	17.6±6.3
Physical demands	12.9±6.9	13.1±6.6
Temporal demands	12.7±7.3	11.2±7.8
Performance	12.5±7.9	12.5±5.7
Effort	11.5±6.8	11.1±9.2
Frustration	6.6±6.4	4.9±5.5
Total	70.8±11.2	70.4±12.4

Table 4.
Mean and standard deviation (SD) for all measures

Variable	Mental demands	Physical demands	Temporal demands	Performance	Effort	Frustration	Total
Age in year							
21 – 30	15.8±6.2	11.8±8.1	12.1±7.9	12.9±7.2	10.0±6.5	5.8±5.9	68.6±13.0
31 – 40	14.4±6.1	13.2±5.5	13.7±7.2	13.4±7.3	10.9±7.9	7.1±5.9	72.8±9.1
41 – 50	13.3±3.3	13.8±9.5	12.0±8.4	14.5±8.2	17.5±8.5	7.8±9.4	79.0±8.2
>50	17.4±5.5	14.1±6.0	9.5±6.5	8.9±6.9	13.0±5.8	3.7±5.8	66.7±12.8
Job							
Doctor	16.6±6.1	10.6±9.1	8.2±8.0	15.7±7.5	11.5±6.4	7.8±6.0	70.4±11.4
Nurse	16.0±7.4	13.1±4.8	12.4±7.9	13.3±6.9	10.7±7.6	4.0±5.2	69.6±12.5
Midwife	17.4±4.0	16.3±6.0	14.5±7.9	11.0±4.9	10.6±7.5	4.2±4.7	74.0±9.5
Lab technician	11.9±4.1	12.8±5.9	12.8±5.9	11.5±8.4	9.7±6.9	11.0±6.9	68.9±10.0
Other	14.9±5.5	12.7±6.9	13.1±7.0	10.8±8.4	14.9±9.0	4.8±6.1	71.4±13.8
Unit of work							
Emergency/ inpatient	19.9±5.2	13.9±7.6	8.8±7.6	13.7±6.2	10.2±6.9	4.6±5.6	71.5±10.2
Poly/ outpatient							
Laboratory	14.2±5.7	13.0±6.4	13.6±8.3	13.1±7.8	11.5±7.6	5.3±5.3	70.8±11.7
Other	11.9±4.1	12.0±7.7	12.8±5.9	11.4±8.4	9.7±6.9	11.0±6.9	68.9±104
	15.6±5.6	12.4±6.2	13.0±6.7	10.3±6.5	15.1±8.8	4.8±6.4	71.2±15.2

Table 5.
The relationship between mental workload (NASA-TLX) with age, job and unit of work

Variable	Age		Job		Unit of work	
	r	p-value	r	p-value	r	p-value
Mental demands	0.088	0.909	-0.187	0.172	-0.349	0.009*
Physical demands	0.106	0.440	0.063	0.650	-0.093	0.500
Temporal demands	-0.066	0.633	-0.208	0.127	0.182	0.182
Performance	-0.133	0.333	-0.213	0.118	0.156	0.256
Effort	0.184	0.178	0.067	0.629	0.099	0.470
Frustration	-0.77	0.577	0.006	0.946	0.156	0.256

*p-value <0.5 was considered as significant using Spearman-test correlation between variables

Table 4 shows the mean and standard deviation of mental workload based on HCWs characteristics. Participants who are between 31 – 40 years old had the highest workload score compared to other groups. Based on job criteria, midwives had the highest mental and physical demands result in a high mental workload. Moreover, HCWs who worked at emergency or inpatient units had the highest mental workload compared to the other units on public health care.

As shown in Table 5, mental demands have significant negative correlation with the unit of work (r = -0.349; p = 0.00), which means that HCWs who worked at emergency/ inpatient units might have higher mental demands than HCWs of the other unit. However, there was no relationship between age and job with the subscale score of mental workload.

This study explores the mental workload based on the task load score of NASA-TLX of HCWs in public health centers during the Covid-19 pandemic. The investigation showed a higher score of mental workload compared with other studies. The previous studies reported the total task load score of mental workload of health workers in the Covid-19 outbreak were 65.9±12.71, 67.79±17.85, and 68.95±17.96 (Shan et al., 2021; Shoja et al., 2020). These findings indicated a high level of mental workload of HCWs in the Covid-19 pandemic (50 – 79).

Based on the study result, there were no significant differences in total load scores between males and females. This finding was supported by the previous study reporting there were no differences on mental workload of HCWs based on the variables of gender, age, and marital status(Pourteimour, Yaghmaei, & Babamohamadi, 2021). However, according to the subscale score, males tend to have high mental and physical demands than females. Otherwise, female HCWs have high frustration score than male HCWs. According to a study, female participants experience higher levels of frustration than male participants as a part of their stress reaction(Calvarese, 2015).

In the present study, most midwives had high levels of mental workload among HCWs. In the public health center, midwives are females who have a responsibility to provide care for mother and their children from pregnancy to delivery. During the Covid-19 pandemic, Public Health Centers as primary health care facility play an important role in handling and prevention of Covid-19 in the community. This role increases service visits and addition to wards which transfer midwives to general ward (other than mother and children ward). The job transfer creates another stressor to the midwives. In addition, vaccination program to all citizens becomes a new burden to health care workers in public health centers. The fear of contagion with Covid-19 patients and lack of training become the causing factors to mental workload of health care workers(Morgantini et al., 2020).

According to the present study, nurses have a lower score of mental workload than doctors and midwives. While the previous study found out that nurses had a higher score of mental workload compared to other HCWs(Shoja et al., 2020). However, based on the total load score of NASA-TLX, there are no significant differences in both studies indicating high levels of mental workload experienced by nurses. Furthermore, based on subscale score among HCWs, laboratory technician had higher levels of frustration than others. A study reported an increase of workload experienced by technicians due to Covid-19 diagnosis (PCR) and management-related testing(Durant et al., 2020). Another study showed that 28.29% of medical technologies (lab staff and radiologists) perceived high stress and 34.03% experienced anxiety during the Covid-19 pandemic(Prasad et al., 2021).

The results of this study indicated that the mental and physical demands of HCWs who worked at emergency or inpatient unit were significantly higher than those who work in other units. There was no similar finding with this study. The previous studies were mostly conducted in a hospital setting that have a variance of wards such as ICU, operating room, emergency and infectious ward which result showed that the emergency unit had high levels of workload after intensive unit and or infectious unit(Pourteimour et al., 2021; Shoja et al., 2020).

The current study showed that unit of work had significant relationship with mental demands. It was consistent with the finding of previous study(Shoja et al., 2020). Both emergency and inpatient units provide care directly to the Covid-19 patients. During the working hours in pandemic situation, the HCWs have to wear personal protective equipment (PPE) to protect themselves for more than 6 hours that could have impacts to the mental burden(Huang, Lin, Tang, Yu, & Zhou, 2020). Mental demands tend to be higher when performing more difficult tasks.

This study has several limitations. The sample size was not adequate to achieve generalization. Furthermore, the use of self-reported questionnaires might have resulted in social desirability bias. Although this study was conducted with a limited number of HCWs in a small area in Indonesia, the findings could be used as a reference and cautiously interpreted in other countries taking into account the cultural context in Indonesia.

LIMITATION OF THE STUDY

This research focuses on describing the mental burden of the health workers during the Covid pandemic without investigating the contributing factors that influences to mental workload. Futhermore, the study was not utilize of a proportional sampling technique to obtain the equal number of samples for each professional group.

CONCLUSIONS AND SUGGESTIONS

According to the study results, HCWs are reported to have high levels of mental workload during Covid-19 pandemic. Based on subscales score, the result indicated a higher level of mental and physical demands perceived by HCWs in public health center. The HCWs who provide care directly to the Covid-19 patients such as in emergency and inpatient units experienced more mental demands. The current data presented an evidence to focus more on the workload and psychological well-being of primary health provider as a frontline HCWs. Mental support and policy should be enhanced by the government or related parties to promote mental health and performance. Further research on social and mental support is needed to reduce mental workload of health workers during the COVID-19 pandemic.

ETHICAL CONSIDERATIONS

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Conflict of Interest Statement

There was no conflict of interest in this study

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