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Is Longer Working Time Associated with Depression and Mental Well-being in Resident and Young Doctors?

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ABSTRACT

Background: Long working hours are known to have a negative impact on health. This study aims to explore the association between long working hours on depression and mental well-being with a nationally representative sample.
Subjects and Method: A cross-sectional study was conducted on 176 resident doctors and young doctors in Indonesia via Google Forms from November 2022 to July 2023. Depression and mental well-being were evaluated using the Patient Health Questionnaire-9 (PHQ-9) and the World Health Organization's five-item Well-Being Index (WHO-5). The correlation between working hours (< 12 hours and ≥ 12 hours on weekdays) and depression was analyzed using multiple linear regression, while the interrelation between working hours and mental well-being applied multiple logistic regression.
Results: A total of 53 (30.11%) resident doctors and junior doctors worked ≥ 12 hours on weekdays. Multiple linear regression analysis revealed that individuals with work duration ≥ 12 hours had a probability of experiencing depression 1.93 units higher than those who worked < 12 hours (b= 1.93; 95% CI= 0.35 to 3.51; p= 0.017). The multiple logistic regression model shows that individuals with work periods of ≥ 12 hours are 2.69 times more at risk of having poor mental well-being than those who work < 12 hours (OR= 2.69; 95% CI= 1.26 to 5.74; p= 0.010).
Conclusion: Working too long is significantly associated with the development of depressive symptoms and poor mental well-being. Management of working hours for resident doctors and young doctors is essential for maintaining physical and psychological health in order to improve the quality of care.

Keywords: long working hours, depression, mental well-being

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BACKGROUND

Work situations have an impression on individual health holistically, and excessive duration has attracted the affection of administrators and functionaries (Li et al., 2019). Based on 2020 or actual Organization for Economic Co-operation and Development (OECD) statistics, the highest average annual working hours include Colombia, Mexico and Costa Rica, with 2,172, 2,124 and 1,913 hours per worker. In Indonesia, Statista (2021) shows that men and women

work an average of 39.88 and 34.81 hours a week. However, extensive data is minimally conclusive.

Clarifying the implications of work duration and psychological impact has attracted the interest of researchers, who are increasingly exposing the fact that long work hours are risky for the mentality (Li et al., 2019). A previous study in Japan using the Center for Epidemiologic Studies Depression (CES-D) scale showed that the odds ratio (OR) for depression in residents who worked 80-99 and 100 hours per week or more was 2.83 and 6.96 (Ogawa et al., 2018). According to multisite prospective cohort research in the United States (US), sleeping ≤ six hours a night and working ≥ 70 hours a week as a resident doctor will significantly increase the risk of depression and chronicity, as well as medical fallacy and attention dysfunction (Kalmbach et al., 2017). Examining this has detrimental consequences for residents and patients, Melo et al. (2016) claim it is logical to have analytical engagement.

An essential conducive atmosphere is provided by the program director, there should be minimum evidence and consequent limitations as a protective entity (Ogawa et al., 2018). Information of Moeller et al. (2016), recently working hours gained global interest and developed a consensus. Some jurisdictions, such as Europe (40–-52.5 hours per week) and the US (80 hours per week) ratified the number of hours residents can work, while shifts in Canada were cut from 32 to 26 hours, and Quebec optimized the 16-hour limit (National Steering Committee on Resident Duty Hours, 2013). Nevertheless, in a number of hospitals, Ogawa et al. (2018) stated that achieving 80 hours per week is not possible.

The relevance of office hours in clinical training curricula has long been recognized, validated by pluralistic investigations. However, data from the Indonesian context is relatively limited, so stakeholders are limited in interpreting urgency. Moreover, Indonesian medical education etiquette is imaged as collectivist and hierarchical, with massive disequilibrium and accentuation (Soemantri et al., 2021). As a result, working hours and mental health programs that are effective in other countries cannot be fully imported (Ramadianto et al., 2022). Based on the above explanation, this study is intended to fill the evidence gap regarding the effect of long working hours on depression and mental well-being in resident doctors and young doctors in Indonesia.

SUBJECTS AND METHOD

1. Study Design

study with a quantitative approach that will take place from November 2022 to July 2023 after the issuance of ethical clearance on October 28 2022. Questionnaires were distributed online using WhatsApp, Instagram and electronic mail to resident doctors and young doctors using the snowball sampling technique.

2. Inclusion Criteria

1) Resident doctors and young doctors.
2) Male and female subjects.
3) Students of specialist medical/specialist dentist education programs or professional medical/dentist professional study programs who are active or inactive (on leave, waiting for the National Competency Test).

3. Exclusion Criteria

1) Subject refuses to participate or does not complete the assessment.
2) Resigned status from PDDikti
3) Have completed education programs or professional medical/dentist professional study programs who are active or inactive (on leave, waiting for the National Competency Test)

4. Operational Definition

Young doctors students who have completed the Bachelor of Medicine program and are continuing their professional studies by undergoing clinical clerkships in each department (House of Representatives of the Republic of Indonesia, 2021).

Resident doctors doctors/dentists who are currently studying as specialist doctors/-specialist dentists (Ministry of Research, 2015).

Depression is a negative affective condition, in the form of feelings of sadness and loss of interest that are continuous and affect everyday life (Chand and Arif, 2022).

Mental well-being is a state of well-being in which individuals realize their own capabilities, are competent to cope with life's stresses, work productively and contribute to the community (World Health Organization, 2018).

Working hours, average duty hours on working days (Monday to Friday) as a student and care provider (Accreditation Council for Graduate Medical Education, 2017).

Year of training, level of years of education (Accreditation Council for Graduate Medical Education, 2017).

Gender, the attachment of traits to men and women which are socially defined by culture, religion and the environment (Siregar, 2018).

Sleep duration, the average amount of sleep per night during the last week (Kalmbach et al., 2017).

History of depression and/or poor mental well-being (PMWB), resident doctors or young doctors with a history of depression and/or PMWB before undergoing specialist or professional studies (Joules, Williams and Thompson, 2014).

Family history of mental illness, family health history of psychiatric disorders (McGrath et al., 2014).

Religiosity, an organized system of beliefs, rites, practices, and symbols, designed to facilitate connection with the sacred or transcendent (Koenig, 2012).

Marital status, the civil status of an individual in marriage or state law (Organization for Economic Cooperation and Development, 2006).

Monthly income, household net income after paying taxes (Tan et al., 2018)

5. Istrument

The study instrument used in this study was the Critical Appraisal Checklist for Cross-sectional Study from the Center for Evidence Based Management (CEBMa, 2014).

6. Data Analysis

The research instrument utilized the Indonesian version of the PHQ-9 for depression screening which was proven to be valid (concurrent), with a Cronbach's alpha of 0.873 (consistent with strong reliability) and receiver operating characteristic (ROC) analysis showing an area under the curve (AUC) of 92% where cut-off value ≥ 5.5; sensitivity 90.7%; and specificity 86.5% (Dian, 2020). Meanwhile, to consider mental well-being status, researchers applied the translated WHO-5, with Cronbach's alpha = 0.864 (Sarfika et al., 2021)

7. Research Ethics

The research was carried out after fulfilling the requirements of the Health Research Ethics Committee (KEPK) of the Faculty of Medicine, Sebelas Maret University with No. 132/UN27.06.11/KEP/EC/2022. Then, informed consent was carried out on respondents where the researcher in this case guaranteed the confidentiality of the information by not disseminating the data to unauthorized parties.

RESULTS

This study involved 92 young doctors and 9 young dentists as well as 71 resident doctors and 4 resident dentists aged 21–41 years

(Mean= 26.97; SD= 4.77) from 36 PTNs and PTSs where the majority of subjects came from Gadjah Mada University with 30 respondents (17.0%).

1. Univariate Analysis

Examining table 2, it is found that the average weekly working hours is 84.55 hours, consisting of a daily average of 9.97 hours and a weekend average of 8.90 hours and an average of 5.65 night shifts a month. Regarding depression and mental well-being, the average score reached 6.33 for PHQ-9 and 15.03 for WHO-5.

Table 3 shows that the majority of subjects were 101 (57.3%) young doctors, 167 of 176 (94.8%) were active students, currently studying in the 2nd year and after that 120 (68.1%), consisting of 102 women (57.9%), had an average shift per day on weekdays < 12 hours, 123 (69.8%), sleep duration in the last week ≤ 6 hours per night, 143 subjects (81.2%), 167 (94.8%) believed that the urgency of religiosity was very important or quite important, A total of 117 doctors (66.4%) were single or separated/divorced (living/died), monthly honorarium < IDR 5,000,000.00 for 137 (77.8%), with depression screening not indicated (score ≤ 4) for 84 participants (47.7%). %), and mental well-being screening indicated better well-being (score ≥ 13) found 123 (69.8%), of which 135 (76.7%) had no history of depression and/or PMWB, and 158 respondents (89.7%) had no history families with mental illness

Table 2. Mean working hours and participating questionnaire scores (n=176)

Variable	Mean	SD	Min.	Max.
Working hours (hours per week)	84.55	32.40	5	168
Weekday working hours (hours)	9.97	4.59	1	24
Weekends working hours (hours)	8.90	5.84	0	24
Night shift (number per month)	5.65	4.23	0	16
Score of PHQ-9	6.33	5.37	0	27
Score of WHO-5	15.03	5.51	0	25

2. Bivariate Analysis

Table 4 displays the results of the independent sample t-test on the influence of weekday working hours, year of training, gender, sleep duration, history of depression and/or PMWB, family history of mental illness, religiosity, marital status, and monthly income on depression. Significant average differences (p<0.05) were found in the variables.

Weekday working hours

Weekday working hours between < 12 hours and ≥ 12 hours obtained CI (95%) = −3.69 to −0.25 and p value = 0.024, where weekday working hours ≥ 12 hours (M = 7.71; SD = 6.38) have a mean PHQ- score. 9 higher than < 12 hours (M= 5.73; SD= 4.78).

History of depression and/or poor mental well-being (PMWB)

Having a history of depression and/or PMWB had a greater mean PHQ-9 score (Mean= 9.70; SD= 5.51) than having no history (Mean= 5.31; SD= 4.90) with CI (95%)= −6.17 to − 2.61 and p value <0.001.

Religiosity

Religiosity between not very important (negative religious coping) and very important or quite important obtained CI (95%) = 3.78 to 10.73 and p value <0.001 where religiosity is not very important (negative religious coping) has a greater mean PHQ-9 score (Mean= 13.22; SD= 5.71) than religiosity is very important or quite important (Mean= 5.96; SD= 5.11). Meanwhile, table 5 contains the results of the chi-square test of the

relationship between mental well-being and weekday working hours, year of training, gender, sleep duration, history of depression and/or PMWB, family history of mental illness, religiosity, marital status, and monthly income, where significant results ($p<0.05$) were found for the variable:

Weekday working hours

Weekday working hours have an Odds Ratio = 4.67 and p value = 0.031 where weekday working hours < 12 hours have better mental well-being 4.67 times compared to weekday working hours ≥ 12 hours.

Gender

The OR value of 5.87 and p-value = 0.015 indicates that female gender plays a role in the risk of PMWB 5.87 times more than male gender.

History of depression and/or poor mental well-being (PMWB)

The OR value= 14.07 and p value<0.001 show that those without a history of depression and/or PMWB experience better mental well-being 14.07 times than those with a history.

Religiosity

Religiosity is very important or quite important has 6.02 times better mental well-being than religiosity is not very important (negative religious coping) (OR= 6.02; p= 0.014).

Table 3. Sociodemographic characteristics of participants (n= 176)

Variable	Frequency	Percentage
Depression		
Score ≤ 4 (no indication of depression)	84	47.7%
Score 5–9 (mild depressive symptoms)	53	30.1%
Score 10–14 (moderate depressive symptoms)	20	11.3%
Score 15–19 (moderate-severe depressive symptoms)	16	9.0%
Score ≥ 20 (severe depressive symptoms)	3	1.7%
Mental well-being		
Score < 13 (indicates PMWB)	53	30.1%
Score ≥ 13 (higher indicates better well-being)	123	69.8%
Weekdays working hours		
< 12 hours	123	69.8%
≥ 12 hours	53	30.1%
Stage		
Young doctor	101	57.3%
Resident doctor	75	42.6%
Student status		
Non-Active	9	5.1%
Active	167	94.8%
Year of training		
First year	56	31.8%
2nd year and beyond	120	68.1%
Gender		
Male	74	42.0%
Female	102	57.9%
Duration of sleeping		
≤ 6 hours	143	81.2%
> 6 hours	33	18.7%
History of depression and/or poor mental well-being (PMWB)		
No	135	76.7%

Variable	Frequency	Percentage
Yes	41	23.3%
Family history of mental illness Family history of mental illness		
No	158	89.7%
Yes	18	10.2%
Religiosity		
Not very important (negative religious coping)	9	5.1%
Very important or quite important	167	94.8%
Marital status		
Single or separated/divorced (alive/dead)	117	66.4%
Married/living together	59	33.5%
Monthly income		
< Rp5,000,000,00	137	77.8%
≥ Rp5,000,000,00	39	22.1%

Table 4. Results of bivariate analysis between independent variables and depression using PHQ-9 scores

Independent Variable	Mean	SD	p
Weekdays working hours			
< 12 hours	5.73	4.78	0.024
≥ 12 hours	7.71	6.38	
Year of training			
First year	5.80	4.74	0.371
2nd year and beyond	6.58	5.64	
Gender			
Male	5.82	5.53	0.283
Female	6.70	5.25	
Duration of Sleeping			
≤ 6 hours	6.38	5.36	0.800
> 6 hours	6.12	5.49	
History of depression and/or poor mental well-being (PMWB)			
No	5.31	4.90	< 0.001
Yes	9.70	5.51	
Family history of mental illness Family history of mental illness			
No	6.25	5.24	0.581
Yes	7	6.50	
Religiosity			
Not very important (negative religious coping)	13.22	5.71	< 0.001
Very important or quite important	5.96	5.11	
Marital status			
Single or separated/divorced (alive/dead)	6.85	5.64	0.070
Married/living together	5.30	4.66	
Monthly income			
< Rp5,000,000,00	5.94	5.26	0.073
≥ Rp5,000,000,00	7.69	5.61	

Table 5. Results of bivariate analysis between independent variables and mental well-being using WHO-5 scores

Variabel Independen	Mental Wellbeing				OR	p
	Score < 13		Score ≥ 13			
	n	%	n	%		
Weekdays working hours						
< 12 hours	31	58.4	92	74.8	4.67	0.031
≥ 12 hours	22	41.5	31	25.2		
Year of training						
First year	16	30.1	40	32.5	0.09	0.761
2nd year and beyond	37	69.8	83	67.4		
Gender						
Male	15	28.3	59	47.9	5.87	0.015
Female	38	71.7	64	52.0		
Duration of Sleeping						
≤ 6 hours	43	81.1	100	81.3	< 0.01	0.979
> 6 hours	10	18.8	23	18.7		
History of depression and/or poor mental well-being (PMWB)						
No	31	58.4	104	84.5	14.07	< 0.001
Yes	22	41.5	19	15.4		
Family history of mental illness Family history of mental illness						
No	48	90.5	110	89.4	0.05	0.820
Yes	5	9.4	13	10.5		
Religiosity						
Not very important (negative religious coping)	6	11.3	3	2.4	6.02	0.014
Very important or quite important	47	88.6	120	97.5		
Marital status						
Single or separated/divorced (alive/dead)	39	73.5	78	63.4	1.71	0.190
Married/living together	14	26.4	45	36.5		
Monthly income						
< Rp5,000,000,00	41	77.3	96	78.0	0.01	0.919
≥ Rp5,000,000,00	12	22.6	27	21.9		

3. Multivariate Analysis

In order to determine the continuity of the influence of more than one independent variable on the dependent variable, a multivariate analysis was carried out. Table 6 shows the results of variable analysis using multiple linear regression, the interpretation includes:

Weekday working hours

There is a significant influence of weekday working hours on the incidence of depression in resident doctors and young doctors. Resident doctors and junior doctors who worked ≥ 12 hours on weekdays (Monday to Friday) had a log odds of experiencing depression of 1.93 units higher than resident doctors and junior doctors who worked < 12 hours on weekdays (b= 1.93; CI 95 %= 0.35 to 3.51; p= 0.017).

History of depression and/or PMWB

There is a significant influence of history of depression and/or PMWB on the incidence of depression in resident doctors and young

doctors. Resident doctors and young doctors who have a history of depression and/or PMWB have a log odds of experiencing depression of 3.83 units higher than resident doctors and young doctors who do not have a history of depression and/or PMWB (b= 3.83; 95% CI= 2.06 to 5.59; p<0.001).

Religiosity

There is a significant influence of religiosity on the incidence of depression in resident doctors and young doctors. Resident doctors and young doctors who believe that religiosity is not very important (negative religious coping) have a log odds of experiencing depression that is 5.21 units higher than resident doctors and young doctors who believe that religiosity is very important or quite important (b= 5.21; 95% CI= 1.82 to 8.60; p= 0.003)

Table 6. Results of multiple linear regression analysis of variables that influence depression

Independent Variable	b	CI 95%		p
		Lower Limit	Upper Limit	
Weekday working hours ≥ 12 hours	1.93	0.35	3.51	0.017
There is a history of depression and/or PMWB	3.83	2.06	5.59	< 0.001
Religiosity is not very important (negative religious coping)	5.21	1.82	8.60	0.003
n observation= 176 Adj R-squared= 0.18 p<0.001				

Meanwhile, table 7 is the result of variable analysis of the multiple logistic regression application, with explanation in the form of:

Weekday working hours

There is a significant influence of weekday working hours on poor mental wellbeing-/PMWB among resident doctors and young doctors, where resident doctors and young doctors who work ≥ 12 hours on weekdays have an OR value of 2.69 and a p value = 0.010 (95% CI = 1.26 up to 5.74) indicates a risk of experiencing poor mental well-being/PMWB of 2.69 times compared to resident doctors and junior doctors with weekday working hours < 12 hours.

Gender

It was found that there was a significant influence of gender on poor mental well-being/PMWB in resident doctors and young doctors. The OR value = 2.63 and p= 0.012 (95% CI = 1.23 to 5.61) shows that female resident doctors and young doctors have a risk of experiencing poor mental well-being/PMWB of 2.63 times compared to male resident doctors and young doctors.

History of depression and/or PMWB

There is a significant influence of a history of depression and/or PMWB with poor mental well-being/PMWB among resident doctors and young doctors, where resident doctors and young doctors who have a history of depression and/or PMWB have an OR= 3.63 and a p value= 0.002 (CI 95%= 1.63 to 8.06) indicates a risk of experiencing poor mental well-being/PMWB of 3.63 times compared to resident doctors and junior doctors with no history of depression and/or PMWB.

Religiosity

The significance of the influence of religiosity on poor mental well-being/PMWB in resident doctors and young doctors was not found. The OR value of 3.11 and p value= 0.148 (95% CI = 0.66 to 14.56) shows that resident doctors and young doctors who believe that religiosity is not very important (negative religious coping) have a risk of

experiencing poor mental well-being/PMW-B of 3.11 times compared to resident doctors and young doctors whose religiosity is very important or quite important, however, is not statistically significan

Table 7. Results of multiple logistic regression analysis of variables that influence poor mental well-being/PMWB

Independent Variable	OR	CI 95%		p
		Lower Limit	Upper Limit	
Working hours (weekdays ≥ 12 hours)	2.69	1.26	5.74	0.010
Sex (female)	2.63	1.23	5.61	0.012
Had history of depression and or PMWB	3.63	1.63	8.06	0.002
Poor religiousity (negative religiousity coping)	3.11	0.66	14.56	0.148
N observation= 176				
Log likelihood= -93.89				
Nagelkerke R^2= 12.81%				

DISCUSSION

The effect of working hours on depression

The results of this study showed that 52.2% of participants indicated depression. As a conclusion, it was found that working hours for resident doctors and junior doctors had a significant effect on depression (b= 1.93; 95% CI= 0.35 to 3.51; p= 0.017). Resident doctors and young doctors with weekday working hours ≥ 12 hours have a probability of experiencing depression 1.93 units higher than resident doctors and young doctors who work < 12 hours.

This is in line with Bondagji et al. (2022) which states that resident doctors have a 2.37 times higher chance of experiencing depression due to long working hours of more than 64 hours per week. An observation of resident doctors in Japan, it was found that the proportion of new-onset depressive symptoms increased with increasing hours worked, where the OR values for the incidence of depression in residents who worked 80 to 99 hours and 100 hours a week or more were 2.83 and 6.96 respectively (Ogawa et al., 2018).

Research by Fang et al. (2022) also revealed that of residents who work > 90 hours a week, 33.4% meet the criteria for depression. Regarding breaking down the correlation between excess work hours and higher PHQ-9 scores, it was concluded that resident doctors with shifts between 40 and 45 hours per week experienced an estimated increase from baseline of 1.8 points, while residents who worked more than 90 hours per week experienced an increase of 5.2 points.

Various recent studies show that long work hours have negative consequences for physical and mental health (Bondagji et al., 2022). In addition, long working hours also contribute to the escalation of suicide risk (Solano et al., 2016). The activities of doctors, including medical students, require this when compared to other professionals (Hameed et al., 2018). Examining old traditions, residencies face difficulties with shifts of more than 36 hours (including on call) without rest. Over the years, researchers in various countries in the United States and Europe have conducted research showing that 16-hour shifts are more efficient without reducing the quality of education. Meanwhile, after 20 hours, a resident doctor is often distracted and lacks

the ability to assimilate what he has learned (Maurice et al., 2011).

The medical profession is stressful and associated with an increasing prevalence of depression, burnout, and other mental health problems. According to Fang et al. (2022), the exclusivity of long working hours in residency is a potential trigger for worsening depressive symptoms. Resident doctors have a greater chance of experiencing stress that ends in depression than senior doctors considering the transition of interpersonal exposure and work environment, as well as anxiety that arises from the contradiction between high professional demands and inadequate capabilities (Ogawa et al., 2018).

The effect of year of training on depression

Statistical studies show that year of training does not have a significant effect on depression (p= 0.371), which is consistent with research by Alothman et al. (2020) previously (p= 0.154). The linear regression model from Bugaj et al. (2020) also shows a negative relationship between year of training and PHQ-9. Nevertheless, Mata et al. (2015) stated that the proportion of physicians who screen positive for depression increases five to six times at the start of residency. The cultural tendency of seniority still allows this to happen apart from workload factors and so on (Hameed et al., 2018). In this regard, differences in findings could be due to variations in study design, or geographic region.

The influence of gender on depression

The findings presented that resident doctors and junior doctors experienced a greater escalation in the mean PHQ-9 score for women but it was not significant. Similar to the research of Li et al. (2019) where gender is not significantly related to the incidence of depression (p= 0.485). A meta-analysis study by Fresna et al. (2021) also strengthens the finding that there is no significant difference between gender and mental health.

This contrasts with epidemiological studies that show being female is associated with an increased risk of depression (Omani-Samani et al., 2019). Women are very vulnerable to experiencing depression during periods of hormonal fluctuation, namely between the start of puberty and menopause (Stepko, 2021). Zhao et al. (2020) suggested that the female gender in depression of the serotonin 2A receptor (5-HT2AR) may play a role as a risk gene.

The effect of sleep duration on depression

Variable analysis showed that sleep duration did not have a significant effect on depression (p= 0.800). The results of this study are in line with Jiang et al. (2022) where sleep duration did not show a substantial correlation to depression. In contrast, subjective sleep, sleep latency, sleep disturbance, habitual sleep efficiency, sleep medication application, and daytime dysfunction proved significant influences. Various studies have shown that poor sleep quality triggers a decline in executive function and makes it difficult to avoid negative thoughts. Sleep problems also affect the function of the neurotransmitter serotonin, which contributes to the development of depression (Dimitriu and Newsom, 2023).

The influence of depression history and/or PMWB on depression

The analysis presented the significance of predictors in that resident doctors and young doctors who had a history of depression and/or PMWB had a probability of experiencing depression 3.83 units higher than resident doctors and young doctors without a history of depression and/or PMWB (b= 3.83; 95% CI= 2.06 to 5.59; p<0.001). The findings of Funkhouser et al. (2021) revealed that individuals with previous depression experienced higher

average levels of negative affect in daily life which is theoretically crucial in depression. According to the American Psychiatric Association (2013), there is at least a 60% lifetime risk of recurrence after the first depressive episode. Regarding repetition, the second episode usually occurs within five years after the first episode (Wilson et al., 2014).

The influence of a family history of mental illness on depression

Incompatible with previous research, this study did not reveal a significant relationship between family history and mental illness and depression (p= 0.581). Almost similar to the findings of Lye et al. (2020) and Gorham et al. (2022) which shows that family history does not increase the course of depression.

In theory, family history is a risk factor for developing depression (Kovacs et al., 1997). There is evidence from family studies that depressive disorders run in families (Sullivan et al., 2000). Researchers have outlined four possible mechanisms contributing to familial depression, namely genetic heritability, the child's dysfunctional neural regulation, the child's exposure to negative parenting patterns, and stressful conditions in the child's life (Goodman and Gotlib, 1999).

The influence of religiosity on depression

Statistical analysis revealed that there was a significant influence between religiosity and the incidence of depression. Resident doctors and young doctors who believe that religiosity is not very important (negative religious coping) have a probability of experiencing depression 5.21 units higher than resident doctors and young doctors who believe that religiosity is very important or quite important (b= 5.21; 95% CI= 1.82 to 8.60; p= 0.003).

Research in adults shows a consistent relationship between levels of religiosity and significant depressive disorders (Smith et al., 2003). Religious factors generally become stronger when life stress increases (Wink et al., 2005).

The influence of marital status on depression

Variable analysis presented that marital status did not have a significant influence on depression (p= 0.070). Inconsistent with the study of Li et al. (2019) which revealed the significance of divorce status as having a 22.14 times higher risk of experiencing depression (OR= 22.14; p<0.001). Grundström et al. (2021) also stated that being single and divorced were found to be risk factors for depressive symptoms and low self-esteem over the 30 year study period. In this regard, marriage has been associated with positive effects on individuals, where a stronger sense of self-identity, improved psychosocial outcomes, as well as escalation of economic and relationship resources especially during stressful life incidents (Kumar et al., 2019).

The effect of monthly income on depression

Statistical analysis shows that monthly income does not have a significant correlation with depression (p= 0.073). Similar to the findings of Li et al. (2019) who stated that the influence of monthly income on depression was not significant (p= 0.402). Some research has examined the relationship between income and depression, with previous literature highlighting the prevalence of depression among low-income individuals (Brody et al., 2018; Patel et al., 2018).

Regarding the results of this study, it is supported by (Assari and Caldwell (2018) who show that higher income is associated with a higher risk of depression. Researchers propose two potential mechanisms for the

observed positive association with upward social mobility changing the composition of available social and individual networks and emotional transactions. Apart from that, the financial situation of the household also makes it possible, such as sharing assets and liabilities, which is more crucial than personal income for depression.

The influence of working hours on mental well-being

As many as 30.1% of respondents were known to have poor mental well-being. Predictor analysis shows that working hours ≥ 12 hours for resident doctors and young doctors have a significant effect on mental well-being. Resident doctors and young doctors who work ≥ 12 hours on weekdays are 2.69 times more at risk of experiencing depression than resident doctors and young doctors who work < 12 hours (OR= 2.69; 95% CI= 1.26 to 5.74; p= 0.010).

In line with Li et al. (2019) which revealed that weekly working hours of more than 60 hours have a 1.66 times higher chance of experiencing PMWB. Long working hours can impact overall health from different perspectives. Clarifying the implications of long work hours for psychological findings, there is increasing evidence that long work hours are detrimental to mental well-being (Li et al., 2019). The findings of Pundati et al. (2018) also revealed that there is a direct relationship between length of service and performance.

This study is one of the first to outline how long working hours affect mental well-being status among resident and junior doctors in Indonesia. Although shifts and on-call standby are an integral part of residency training, restrictions on working hours need to be initiated to improve patient safety and resident mental well-being (Lin et al., 2016).

The stimulus for working hours reform occurred in the United States, starting after the death of Libby Zion, an 18 year old woman who died under residential care in New York City in 1984 (Temple, 2014). Current American guidelines follow policies established by the Accreditation Council for Graduate Medical Education (ACGME). New requirements were released in 2017 where the maximum shift is 24 hours for all residency programs except emergency medicine which is limited to 12 hours. Meanwhile, for The European Work Time Directive (EWTD), the guidelines limit it to 48 hours per week (Temple, 2014). In contrast to this, Indonesia does not have a national limit on working hours for medical students, while the working hours of resident doctors have received international interest considering that not a single reference disputes the urgency of working hour regulations in maintaining mental health and well-being.

The effect of year of training on mental well-being

Variable analysis revealed that year of training did not have a significant effect on mental well-being (p= 0.761). A negative correlation was also obtained in the study of Mirza et al. (2018) that there is no significant disparity between different post-graduate year levels. The researchers hypothesized that the resulting negative impact on well-being would be lowest in the first year of education (clinical clerkships and initial residency) and increase with level of study, but the results of the analysis did not show this.

The influence of gender on mental well-being

Analysis showed that female resident doctors and young doctors had a 2.63 times greater risk of PMWB than male resident doctors and young doctors (OR= 2.63; 95% CI= 1.23 to 5.61; p= 0.012). These results are in line with Li et al. (2019) which states that female gender has a 2.92 times higher

chance of experiencing PMWB (OR= 2.92; p= 0.048).

Research by Dreger et al. (2016) revealed the odds of women reporting good mental well-being compared to the male gender were significantly lower regardless of further individual-level sociodemographic variables. Women are known to have a higher lifetime prevalence of mood provocation and anxiety (Riecher-Rössler, 2017). Some of the power is explained by the potential role of sex hormones such as estrogen and progesterone which influence serotonin (a chemical messenger/feel good) agitator of mental well-being (Stepko, 2021).

The influence of sleep duration on mental well-being

Sleep duration was not statistically related to mental well-being (p= 0.979). Sleep is interpreted as the third pillar of health, after nutrition and exercise (Castillo, 2015). The causality of sleep related to mental health is still unclear. One way to test the interrelation is to evaluate interventions that improve sleep quality and improve mental health (Scott et al., 2021).

The influence of a history of depression and/or PMWB on mental well-being

There was a significant influence between a history of depression and/or PMWB and mental well-being, where resident doctors and young doctors who had a history of depression and/or PMWB had a risk of experiencing PMWB 3.63 times greater than resident doctors and young doctors without a history of depression and/or PMWB. or PMWB (OR= 3.63; 95% CI= 1.63 to 8.06; p= 0.002). Some authors state that mental disorders may have a stronger effect on mental well-being than physical disorders due to mood fluctuations and compromised ability to display adaptive behavior (Binder and Coad, 2013).

The influence of a family history of mental illness on mental well-being

A non-significant effect was found on family history of mental illness on mental well-being (p= 0.052). A family history of mental illness has been linked to the occurrence of various mental illnesses in offspring (Post et al., 2018). However, it cannot be denied that mental disorders can occur in various conditions, not focused on hereditary factors (Ulya et al., 2018). Genetics is only one of a number of causes, while other elements such as biology and environment are also possible. The knowledge base surrounding the transmission of family narratives is quite interesting and indicates particular areas of significance that require further exploration, especially by integrating other specific factors and analyzing the impact on mental well-being (Elias and Brown, 2022).

The influence of religiosity on mental well-being

The OR value is 3.11 and the p value= 0.148 shows that religiosity is not significant for mental well-being (OR= 3.11; 95% CI= 0.66 to 14.56; p= 0.148). Incompatible with research by Barman et al. (2022) who found the significance of the influence of religiosity and spirituality on mental well-being. In contrast, Aksoy et al. (2022) suggested that reported religious urgency does not have or has the potential to have a negative association with mental well-being.

Regarding religiosity and mental well-being, the existing evidence is relatively limited and varied. Further specific longitudinal studies are needed in this area.

The influence of marital status on mental well-being

There was also no significant effect of marital status on mental well-being (p= 0.190). Compatible with previous research that there is no significant disparity in marital status towards poor mental well-being (OR= 1.95; p= 0.378) (Li et al., 2019).

In contrast, the study of Grundström et al. (2021) proves that single and divorced status is likely to experience worse mental well-being. Almost in line with this, Hsu and Barrett (2020) link marital status with psychological well-being, where married status is better than never being married. It is possible that social and emotional support in a household can be an important catalyst in a coping mechanism for life's difficulties that leads to increased psychological well-being (Moss and Willoughby, 2018).

The effect of monthly income on mental well-being

There was also an insignificant effect of monthly income on mental well-being (p= 0.919). Incompatible with the study of Syrén et al. (2020) who found a positive relationship between monthly income and mental well-being.

The findings of this study show the limited role of income in mental well-being, which is supported by psychological literature that various factors such as personality traits are important contributors to mental well-being. According to Steel et al.'s (2008) meta-analysis, personality traits explain 40–60% of the variation in mental well-being indices.

AUTHOR CONTRIBUTION

Ayu Nanda Sari, as the principal researcher, was responsible for selecting the topic, gathering and compiling, as well as analyzing the data. Hanung Prasetya and Bhisma Murti, as supervisors, provided guidance in statistical analysis and the preparation of the publication manuscript.

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CONFLICT OF INTEREST

The author declares that there is no conflict of interest in this research.

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