

# Predictors of Depressive Symptoms among Family Caregivers of Patients with Dementia in Java, Indonesia

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## ABSTRACT

**Objective:** Depressive symptoms are common mental health problems among the family caregivers of patients with dementia. However, little is known about the prevalence of depressive symptoms among the family caregivers of patients with dementia in Indonesia. This study aimed to examine: 1) the factors predicting depressive symptoms, 2) the mediating role of social support in the relationship between burden and depressive symptoms, and 3) the association between depressive symptoms and healthcare utilization among family caregivers.

**Methods:** This was a cross-sectional study involving 250 family caregivers of patients with dementia recruited from four hospitals in Java, Indonesia. Data were collected by Zarit Burden Interview (ZBI); the Neuropsychiatric Inventory Questionnaire (NPI-Q), the Mastery scale, the Multidimensional Scale of Perceived Social Support, and the Center for Epidemiologic Studies Depression (CES-D) Scale. Descriptive statistics, chi-square test, hierarchical multiple linear regression, and Baron and Kenny's regression method were used to analyze the data.

**Results:** The results revealed that about a quarter of the participants (24.8%) experienced depressive symptoms. Caregiver burden, mastery, behavioral and psychological symptoms of dementia, and social support explained 45.5% of the variance in the prevalence of depressive symptoms among family caregivers ( $R^2=0.455$ ). Social support also partially mediated the association between caregiver burden and depressive symptoms. There was no association between depressive symptoms and the use of healthcare services among the family caregivers.

**Conclusion:** The findings revealed that social support is a mediating factor affecting the relationship between caregiver burden and depressive symptoms. Interventions targeting social support to help alleviate caregiver burden would be effective in helping reduce depressive symptoms in the family caregivers of patients with dementia.

**Keywords:** Depressive symptoms; dementia; caregiver; burden; social support (Siriraj Med J 2021; 73: 549-558)

## INTRODUCTION

Alzheimer's Disease International reported that almost 50 million people worldwide have dementia, and projections indicate that the number of people with dementia will be 152 million in 2050, having more than tripled since 2015.<sup>1</sup> In Indonesia, which is the fourth

most populous country in the world, the proportion of older people in the population is dramatically growing, and thus the number of patients with dementia (PWDs) is likely to rise. Indonesia had an estimated 1.2 million patients with dementia in 2016, with 2 million forecast by 2030 and 4 million by 2050.<sup>2</sup> PWDs are affected by

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a progressive and significant deterioration that results in impaired memory, judgment, communication, and function.<sup>3,4</sup> Over time, PWDs become more and more dependent on their family for support alongside the progression of the illness and their gradual deterioration. Family caregivers provide comprehensive care to the increasing and demanding circumstances experienced by PWDs,<sup>5</sup> leading them to face chronic stress, which can contribute to them experiencing poor mental health, including depressive symptoms.<sup>6</sup>

A meta-analysis of 13 studies reported an aggregate prevalence of depressive symptoms among 34% of PWD caregivers.<sup>6</sup> If left untreated, depressive symptoms can lead to major depressive disorder. A prospective cohort study in the USA examining the incidence of depression and anxiety disorders among the caregivers of PWDs without clinical depression or anxiety disorder at baseline showed that 60% of the caregivers developed a depressive and/or anxiety disorder within 24 months.<sup>7</sup> Furthermore, the need to assume a caregiving role can leave depressed caregivers at a high risk of developing poor health outcomes, such as a decline in their health status,<sup>8</sup> cognitive decline,<sup>9</sup> and even having suicidal thoughts.<sup>10</sup> Depressive symptoms can also exacerbate caregivers' preexisting disease or even increase their susceptibility to other diseases, while there is evidence that family caregivers of PWDs tend to have a high rate of healthcare use.<sup>11</sup> Consequently, a high prevalence of depressive symptoms among PWD caregivers will also have a wider impact on society, impacting economic development, social welfare, and public health awareness.

The present study was guided by the Stress Process Model<sup>12</sup> which explains stress through the relationship patterns among four domain and mediating factors. The domains consist of the: 1) background and context, 2) stressors, 3) stress mediators, and 4) stress outcomes. The background and context refer to stress related to sociodemographic, family, and network information. The stressors are conceptualized into primary and secondary stressors; whereby primary stressors are related directly to the caregiver activity in providing care, while secondary stressors do not directly stem from the illness and caregiving but are rather split into role strain, such as family conflict, work conflict, and constriction of social life, and intrapsychic strain, such as self-esteem and mastery. Coping and social support are identified as mediators to describe how these factors provide a buffering effect to the outcomes through direct and indirect pathways. The interrelationship between the caregiver background and context, stressors, and mediators leads to the stress outcomes, as the fourth

domain. All these factors may lead to a decline in the family caregiver's physical health and mental health and can impact the family caregiver's overall health, such as restricting their physical activities and causing depression.<sup>12</sup>

Attempts have been made to examine the factors influencing the prevalence of depressive symptoms in the family caregivers of PWDs, including the caregiver's characteristics, caregiver burden, behavioral problems of the PWD, mastery, and social support. There is mixed evidence regarding the caregiver's characteristic and depressive symptoms; for instance, older caregivers, female, the caregiver relationship, and employment status are predictors of depressive symptoms arising among family caregivers,<sup>13-15</sup> while some studies have found that age, gender, caregiver relationship, and employment status could not predict depressive symptoms.<sup>15-17</sup> Few studies have investigated the relationship between the caregiving duration and prevalence of depressive symptoms among caregivers, although one study reported that caregiving duration was a predictor of depressive symptoms among caregivers.<sup>15</sup> Caregiving duration is a critical factor in the context of care as caregivers may take on the caregiving role for lengthy periods and this might play a major role in their mental health.

Despite the extensive research in this area, no previous study has been done in an Indonesia context, with most research to date conducted in Western countries, where the cultural beliefs and norms might differ. Moreover, this scarce research on dementia caregiving in Indonesia means that uncertainty exists regarding the risks and protective factors of depressive symptoms among family caregivers of PWDs in Indonesia. Understanding these issues is important to enable suitable interventions to be made to address family caregivers' needs in ways that are culturally appropriate.

Consequently, to fill the gap, the aims of this study were to examine, in an Indonesian context, the: 1) prevalence of depressive symptoms among family caregivers; (2) caregiver's sociodemographic factors, BPSD, caregiver burden, mastery, and social support as predictors of depressive symptoms among family caregivers of PWDs; (3) mediating role of social support on the relationship between burden and depressive symptoms; and (4) relationship between depressive symptoms and the utilization of healthcare services among family caregivers of PWDs.

## MATERIALS AND METHODS

A cross-sectional study was conducted of the family caregivers of PWDs who attended four outpatient tertiary

hospitals on the island of Java, Indonesia, between April to September, 2019. All the participants were more than 18 years old, had assumed the primary caregiver's role without receiving any reward or salary for this service for at least six months, and were living with the PWD in the same household. Family caregivers over 60 years old were excluded if they had cognitive impairment with a Six-item Cognitive Impairment Test (6CIT)<sup>18</sup> score of >7. The patients were diagnosed with dementia according to the International Statistical Classification of Diseases (ICD-10).<sup>19</sup>

Approval to conduct the study was obtained from the Institutional Review Board Faculty of Nursing at Mahidol University (COA No. IRB-NS 2019/488.0603) and the Ethics Committee of Nursing Research, Faculty of Nursing, Universitas Indonesia (138/UN2.F12. D/HKPP.02.04/2019). The sample size calculation was based on a previous study with an estimated  $R^2=0.30$ ,<sup>20</sup> and an estimated sample size for varying numbers of predictor variables.<sup>21</sup> With nine predictors and an estimated  $R^2=0.30$ , 250 family caregivers were recruited for this study.

In addition to the demographic characteristics and clinical information collected from the family caregivers, the study participants were also asked to complete a questionnaire about their healthcare utilization in the preceding 6 months, such as which healthcare services they had visited in the preceding 6 months, as well as five self-reporting questionnaires that addressed separate conditions. All the instruments were back-translated into Bahasa (Indonesia language) with permission from the instruments' developers.

Burden was assessed by Zarit Burden Interview (ZBI),<sup>22</sup> which consisted of 22 items with total scores ranging from 0-88, where a higher score indicated a higher burden. The Cronbach's alpha coefficient obtained from our sample was 0.91. MAPI Research Trust granted permission to use this instrument and back-translated it into Bahasa.

Behavioral and psychological symptoms of dementia were assessed by the Neuropsychiatric Inventory Questionnaire (NPI-Q), a shorter version of the Neuropsychiatric Inventory (NPI).<sup>23</sup> The range of scores for severity was 12-36, while the caregiver distress score ranged from 0-60. Here, a higher score pointed to a higher severity of neuropsychiatric symptoms (NPS) of the PWDs and caregiver distress. The Cronbach's alpha coefficient obtained from our sample was 0.90.

Mastery was assessed by the Mastery scale developed by Pearlin and Schooler, and consisted of 7 items.<sup>24</sup> The total possible scores ranged from 7-28, where a higher score indicated a higher level of mastery or a stronger

sense of caregiver control over their own lives. The Cronbach's alpha coefficient obtained from our sample was 0.66.

Social support was assessed by the Multidimensional Scale of Perceived Social Support (MSPSS), which is a 12-item questionnaire, developed by Zimet et al.<sup>25</sup> The total possible score ranged from 12-84, where a higher score indicated a higher level of perceived social support. The Cronbach's alpha coefficient obtained from our sample was 0.87.

Depressive symptoms were assessed by the Center for Epidemiologic Studies Depression (CES-D) scale, which is a 20-item questionnaire developed by Radloff.<sup>26</sup> The total possible score ranged from 0-60; scores of 16 or higher are a cutoff point indicating depressive symptoms. The Cronbach's alpha coefficient obtained from our sample was 0.87.

### Data analysis

Data were analyzed using the SPSS 18.0 software program. Descriptive statistics were used to assess the demographic characteristics and study variables. To identify the relationship between depressive symptoms and healthcare service utilization, analysis was performed using the chi-square test. Hierarchical regression analysis was used to identify the predicting factors of depressive symptoms. To examine the mediating role of social support on the association between burden and depressive symptoms in the family caregivers of PWDs, Baron and Kenny's method was used.<sup>27</sup>

## RESULTS

### Characteristics

**Caregivers.** The average age of the participants was 50.2 years old (SD=14.26; range, 20-92). The majority of family caregivers were females (74.4%), Muslim (86.0%), and married (89.6%). Considering the relationship to the PWD, the highest proportion was adult children (47.2%), with an average caregiving duration of 22.6 months (SD=16.85), and had other family members living in the same house. About 40% graduated from senior high school. Over half the caregivers were unemployed (53.2%), and the majority of participants reported having sufficient family income (74%). The majority of participants cared only for PWDs (89.6%) and had health insurance (89.2%). Regarding health status, over half the family caregivers (52.8%) rated themselves as very healthy, as shown in [Table 1](#).

**Patients.** The average age of the PWDs was 67.2 years old (SD=9.25; range, 43-92). Most of the PWDs were male (56.8%) and married (73.2%). The majority of the

**TABLE 1.** Characteristics of family caregivers of patients with dementia (n = 250).

Demographics characteristics	Number (%)
<b>Gender</b>	
Male	64 (25.6)
Female	186 (74.4)
<b>Age (Years)</b>	
20 - 39	59 (23.6)
40 - 59	123 (49.2)
60 - 79	66 (26.4)
80 - 92	2 (8)
Mean = 50.2, SD = 14.26, Min = 20, Max = 92	
<b>Education level – top level reached</b>	
No formal education	5 (2)
Primary school	64 (27.2)
Senior high school	101 (40.4)
College/University	76 (30.4)
<b>Religion</b>	
Muslim	215 (86)
Christian	33 (13.2)
Other	2 (0.8)
<b>Marital Status</b>	
Married	224 (89.6)
Single	19 (7.6)
Widowed, divorced, or separated	7 (2.8)
<b>Employment status</b>	
Employed	117 (46.8)
Unemployed	133 (53.2)
<b>Family income (rupiah/month)</b>	
≤ 1,000,000	48 (19.2)
1,000,001-4,000,000	112 (44.8)
4,000,001-8,000,000	62 (24.8)
> 8,000,000	28 (11.2)
Mean = 4,1777,2000, SD = 4,097,839.59, Min = 200,000, Max = 27,000,000 (14,400 rupiah = 1 USD)	
<b>Income adequacy</b>	
Sufficient	185 (74)
Insufficient	65 (26)
<b>Relationship to the PWD</b>	
Adult children	118 (47.2)
Spouse	115 (46)
Relatives	17 (6.8)
<b>Duration of caregiving (months)</b>	
6 - 12	112 (44.8)
13 - 24	69 (27.6)
25 - 36	38 (15.2)
37 - 48	13 (5.2)
≥ 49	18 (7.2)
Mean = 22.6, SD = 16.85, Min = 6, Max = 84	
<b>Number of members in the household</b>	
1 - 3	112 (44.8)
4 - 6	118 (47.2)
≥ 7	20 (8)
Mean = 4, SD = 1.69, Min = 1, Max = 11	
<b>Caring for other family members</b>	
No	224 (89.6)
Yes	26 (10.4)
<b>Caregiver with health insurance</b>	
Yes	223 (89.2)
No	27 (10.8)
<b>Self-rated health</b>	
Very healthy	132 (52.8)
Somewhat healthy	36 (14.4)
Somewhat unhealthy	80 (32)
Very unhealthy	2 (0.8)

PWDs were Muslim (85.6%), and just under one-third (20.4%) had attended college or university. The average length of dementia was 24.0 months (SD=17.82), and almost all (93.2%) the PWDs had health insurance, as shown in [Table 2](#).

The average CES-D score was 11.70 (SD=8.03). The majority of the family caregivers (75.2%) had a CES-D score of less than 16, while 24.8% of the family caregivers had a CES-D score of more than 16, indicating that they were suffering from depressive symptoms.

### Predictors of depressive symptoms

Except for the caregivers' characteristics, other

independent variables also made a significant contribution to explaining the variance in caregivers' depressive symptoms. The incremental changes in  $R^2$ , the proportion of variance explained by each block of variables, were 3.3%, 5.6%, and 36.5% for the caregivers' characteristics, social support, and stressors in caregiving. Social support ( $b=-0.003$ ,  $p=0.043$ ), BPSD ( $b=0.002$ ,  $p=0.014$ ), caregiver burden ( $b=0.010$ ,  $p<0.01$ ), and mastery ( $b=-0.027$ ,  $p<0.001$ ) were significantly related to the caregivers' depressive symptoms. These factors explained 45.5% of the variance in the family caregivers' depressive symptoms, as shown in [Table 3](#).

**TABLE 2.** Characteristics of the patients with dementia (n = 250).

Characteristics	Number (%)
<b>Gender</b>	
Male	142 (56.8)
Female	108 (43.2)
<b>Age (years)</b>	
41 - 60	59 (23.6)
61 - 80	172 (68.8)
≥ 80	19 (7.6)
Mean = 67.2, SD = 9.25, Min = 43, Max = 92	
<b>Marital status</b>	
Married	183 (73.2)
Widowed, divorced, or separated	64 (25.6)
Single	3 (1.2)
<b>Education level</b>	
No formal education	21 (8.4)
Primary school	98 (39.2)
Senior high school	80 (32)
College/university	51 (20.4)
<b>Religion</b>	
Muslim	214 (85.6)
Christian	33 (13.2)
Hindu	1 (0.4)
Other	2 (0.8)
<b>PWD with health insurance</b>	
Yes	233 (93.2)
No	17 (6.8)
<b>Duration of dementia (months)</b>	
6–12	107 (42.8)
13–24	66 (26.4)
> 25	77 (30.8)
Mean = 24.0, SD = 17.82, Min = 6, Max = 84	

**TABLE 3.** Hierarchical multiple regression analysis for factors predicting depressive symptoms (n = 250).

Predictor	Block 1			Block 2			Block 3		
	<i>b</i>	SE ( <i>b</i> )	<i>p</i> -value	<i>b</i>	SE ( <i>b</i> )	<i>p</i> -value	<i>b</i>	SE ( <i>b</i> )	<i>p</i> -value
Age	0.001	0.002	0.737	0.001	0.002	0.619	- 0.001	0.001	0.389
Gender	0.073	0.048	0.130	0.072	0.047	0.123	0.026	0.037	0.480
Employment status	- 0.094	0.041	0.024	- 0.088	0.040	0.031	- 0.038	0.032	0.230
Duration of caregiving	- 0.095	0.074	0.200	- 0.063	0.073	0.387	0.010	0.057	0.861
Children	- 0.014	0.056	0.800	0.004	0.055	0.935	- 0.049	0.044	0.267
Relatives	0.016	0.083	0.847	0.041	0.081	0.617	- 0.022	0.063	0.728
Social support				- 0.007	0.002	< .001	- 0.003	0.001	<b>0.043</b>
BPSD							0.002	0.001	<b>0.014</b>
Burden							0.010	0.001	<b>&lt; 0.001</b>
Mastery							- 0.027	0.006	<b>&lt; 0.001</b>
R <sup>2</sup>	0.033			0.090			0.455		
ΔR <sup>2</sup>				0.056			0.365		
ΔF				15.006*			53.352*		

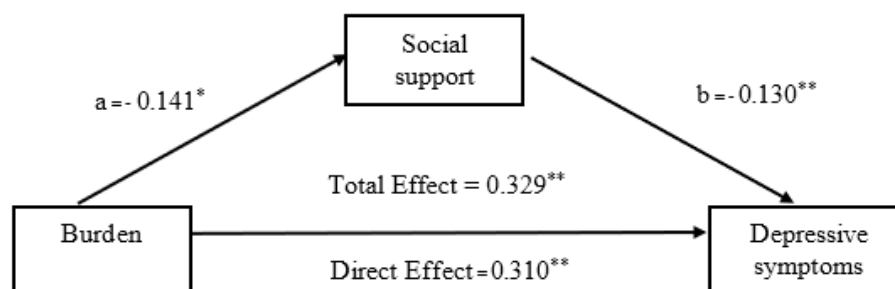
Significance level: \* $p < 0.05$

### Mediating effects of social support

From multiple regression analyses, it was found that the caregivers' social support partially mediated the relation between the caregiver burden and depressive symptoms (Fig 1). In the first regression model (path c), caregiver burden independently predicted depressive symptoms in a significant manner ( $b=0.329, p<0.001$ ). In the second regression model (path a), caregiver burden independently predicted social support ( $b=-0.141, p=0.002$ ). In the third regression model (path b), social support independently predicted depressive symptoms ( $b=-0.130, p<0.001$ ). In the fourth regression model

(path c') and after controlling for the effect of social support (mediator variable), caregiver burden remained a significant independent predictor of depressive symptoms ( $b=0.310, p<0.001$ ). These bootstrapping results verified the significant indirect effect of social support,  $b=0.018, 95\%CI (0.002-0.045)$ , suggesting a partial mediating effect of social support on the relation between the caregiver burden and depressive symptoms.

With regard to healthcare utilization, the relation between depressive symptoms and healthcare utilization was not statistically significant as shown in Table 4.



**Fig 1.** Mediation effects of social support on the relationship between the caregiver burden and depressive symptoms.

**TABLE 4.** Correlation between depressive symptoms and healthcare utilization.

Variable	Healthcare utilization		Chi-square ( $\chi^2$ )	p-value
	No (%)	Yes (%)		
No Depression (0 -15)	168 (89.4)	20 (10.6)	1.87	<b>0.171</b>
Depression (16 -40)	59 (95.2)	3 (4.8)		

## DISCUSSION

Depressive symptoms were evident in nearly a quarter of the family caregivers (24.8%) of PWDs in Indonesia, which was a lower prevalence than reported in other countries. For instance, the rate was 34.2% among Japanese informal caregivers of community-dwelling elderly persons,<sup>28</sup> in Taiwan, the rate of depressive symptoms was 43.8%,<sup>29</sup> and the rate of depressive symptoms in the USA was found to be 47%.<sup>30</sup> A possible explanation for this may be related to the different cultural beliefs in Indonesia regarding the caregiving role as well as due to some characteristics of the caregivers. In Indonesia, caring for ill family members is considered the moral responsibility of the whole family. Indonesia's collectivist culture emphasizes the interdependence between family members. Caregiving is thus not the sole responsibility of a single individual; other family members pitch in with assistance, advice, and support as needed.<sup>31</sup> It is also important to consider the stage of dementia of the patient. On average, in our study the PWDs had been diagnosed for two years or less, likely reflecting an early stage of dementia. Thus, the PWDs in our study may have had relatively less memory and behavioral problems and a minimal need for support in their daily activities at this stage of their dementia, which could have meant less psychological distress on the caregivers.

BPSDs were found to be predictors of depressive symptoms. The finding is similar to that of previous studies, which revealed that behavioral and psychological symptoms of dementia (BPSDs) are strong predictors of depressive symptoms.<sup>17,32,33</sup> As indicated by the Stress Process Model,<sup>12</sup> the primary stressors related to caring for PWDs impact caregiver depression. As behavioral problems of the PWDs increase in frequency and severity, the family caregivers will face increasing stress and difficulty in providing care. Neuropsychiatric symptoms in PWDs are varied and intrinsically unpredictable in terms of emotional experience, thought content, insight, and motor function appearance. These problematic

behaviors of PWDs are challenging to treat and are often embarrassing, contributing to the caregiver's depression.

Caregiver burden is found to be a predictor of depressive symptoms. The finding is consistent with previous studies, which found that caregiver burden is a strong predictor of depressive symptoms.<sup>16,34</sup> A possible explanation for this may be related to the care demands of the PWD. Burden is a subjective perception in terms of negative feelings of caregivers on the stressors in the caregiving situation.<sup>22</sup> In this study, caregivers may have little control over those demands since dementia is an incurable, progressive disease and may arise in the caregiving responsibilities. Also, demands from other family needs, social obligations, and work contribute to increasing the burden on caregivers. One previous study revealed that constraints on a caregiver's life due to caring can cause a more significant impairment to their mental health.<sup>5</sup> The uneasiness of family caregivers' increases as the PWD condition worsens, along with the onset of BPSDs in the PWD and a consequent reduction of the PWD's independence in daily life. As a result, there is a higher burden on family caregivers, leading to more stress and more depression.

The finding that mastery is a negative predictor of depressive symptoms is similar to in a previous study.<sup>35</sup> Mastery is the extent to which an individual believes that life chances are under his/her own control,<sup>24</sup> thus, it is related to a sense of control. The more frequently family caregivers' efforts result in higher task achievement, the more intensely the caregiver believes that he/she has control over what occurs in their life in common with the PWD. However, caring for a PWD can contribute to a caregiver's feelings of lack of control since dementia is a devastating chronic illness with no known cure that leads to the PWD manifesting unsettling alterations, which may decrease the caregiver's feeling of mastery. When caregivers feel adaptive in their role, they can develop a higher sense of mastery, which will reduce their depressive symptoms.<sup>35</sup>

Social support appears to be a significant predictor in our study. This result is congruent with previous studies.<sup>15</sup> Social support is the perception that one is accepted, cared for, and provided with assistance from certain individuals or a specific group.<sup>36</sup> Social support can decrease depressive symptoms among family caregivers of PWDs through providing emotional support, information about dementia care, and by helping to solve the family caregiver's problems.<sup>15</sup> Furthermore, most family caregivers in this study lived in extended-family households, which should ease the family caregiver's burden by having others share in the informal caregiving demands and reinforcing the caregiver's feeling of not being left to cope alone in a difficult situation. Social support plays an important role in improving family caregivers' mental health outcomes.<sup>15</sup>

The results revealed a mediating role of social support on the relationship between the caregiver burden and depressive symptoms. This findings are similar to that of another study, which found that social support mediated the relationship between the burden and general health of caregivers.<sup>37</sup> The findings affirmed the role of social support as a buffer against caregiver burden, and this was in line with the Stress Process Model.<sup>12</sup> Caring for the PWD also consumes the family caregiver's resources. Social support can alleviate the situational caregiving burden and the caregiver's emotional responses to those burdens, thereby directly reducing the physical and psychological consequences of these stressors. When a family caregiver is under stress, social support can lead to the family caregivers underestimating the caregiving burden and the vagaries of stress.<sup>15</sup> That is, social support reduces the relationship between the caregiver burden and depressive symptoms. However, this study found a partial mediating effect of social support, which suggests that additional factors are also important regarding this relationship.

This study found that depressive symptoms had no relationship with healthcare utilization among the family caregivers of PWDs during the six months preceding the study. Our finding is contrasted to that of a previous study, which found that caregivers were 1.023-1.044 times more likely to visit the doctor, have outpatient tests and procedures, and take over the counter and prescription medications,<sup>11</sup> In addition, depressed caregivers were more likely to use healthcare services, including outpatient tests, procedures, and medical appointments, than non-depressed caregivers.<sup>11</sup> One possible explanation for this may actually be due to the failure of chi-square statistics. The assumption in the chi-square test is that the expected value in each cell is

greater than 5.<sup>38</sup> In the present study, the observed value in those who were depressed and who utilized healthcare services involved only 3 cases. However, most caregivers in this study were female, middle aged (an average of 50 years old), and married. Also, over half rated their health status as "healthy" (67.2%). A previous study showed that self-rated health is significantly associated with an individual's perceived need to use healthcare services.<sup>39</sup>

### Limitations

In summary, this study revealed more about the phenomenon of the family caregivers of PWDs experiencing depressive symptoms but in an Indonesian context. The findings support the concepts represented in each domain proposed in the Stress Process Model.<sup>12</sup> However, the key limitation of this study is its cross-sectional design. Depressive symptoms experienced at any one point in time may not reflect the experience of depressive symptoms over time. Thus, a longitudinal study may help identify the impact of specific episodes as the symptoms of depression change significantly throughout the caregiving experience.

### CONCLUSION

Based on the study findings, this study utilized theory-based research to inform nursing practice in Indonesia. It identified specific factors (including caregiver burden and BPSDs) that place some family caregivers at a higher risk of developing depressive symptoms. It has been suggested that nurses should implement a caregiver screening tool to help identify vulnerable family caregivers, which would enable them to provide appropriate and timely interventions. An effective intervention targeting social support for dealing with caregiver burden would help reduce the depressive symptoms in family caregivers. Further studies should be carried out on the family caregivers of PWDs who are in the middle and more advanced stages of dementia. Such studies will help nurses understand the caregiving experience and symptoms of depression among family caregivers in each stage of dementia progression. In addition, an intervention study targeting the depressive symptoms of family caregivers of PWDs is required.

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