Research Article

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Factors Relating to Family Caregiver Stress that Affect Neuropsychological Status of Elderly Patients

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Abstract

Background: *The Mini-Mental State Examination (MMSE) is the most powerful predictor of life expectancy in dementia patients, and dementia patients with more functional impairment and psychiatric symptoms reportedly may have a shorter life expectancy. Many studies have reported that factors affecting MMSE in dementia patients involve health conditions such as hypertension and cardiovascular disease. However, no study has found that a caregiver's sense of caregiving burden is an independent factor that affects MMSE in dementia patients.*

Objective: *This study aimed to identify factors that influence MMSE in dementia patients.*

Methods: *A cross-sectional survey of dementia patients and caregivers was conducted to investigate factors affecting MMSE in dementia patients. Logistic regression analysis was used to identify factors which predict a lower MMSE.*

Results: *Caregiver's sense of caregiver burden (ZBI) was identified as a factor that affects MMSE in dementia patients (OR: 1.063, 95%CI: 1.009-1.120). Furthermore, MMSE was correlated with caregiver gender (p=0.001), which in turn was related, albeit non-significantly, to MMSE (p=0.060, OR: 5.592).*

Discussion: *ZBI was the strongest predictor of MMSE in dementia patients. Given the possibility that a caregiver's sense of caregiving burden indirectly affected MMSE, efforts to prevent declines in MMSE due to an increased sense of caregiver burden are important. Furthermore, the sense of caregiver burden will need to be reduced also to maintain and improve the cognitive function of dementia patients. Caregiver gender was identified as a potential predictor of MMSE. Specifically, male caregivers may experience difficulties with balancing work, caregiving, and housework, and may be absent during the day due to work. This could lead to dementia patients spending more time without daytime care, leading to the progression of dementia.*

Conclusion: *Our findings highlight the importance of managing the state of a caregiver's sense of caregiving burden, which was shown to impact MMSE in dementia patients. Measures to prevent the sense of caregiving burden from worsening are needed. To this end, efforts to provide comprehensive support to improve caregivers' mental health may be effective.*

Keywords: Dementia Caregiver, Predictors of MMSE, Dementia Patient, Caregiver Burden

Introduction

The Mini-Mental State Examination (MMSE) is the strongest predictor of life expectancy in dementia patients. Life expectancy correlates with lower MMSE, and dementia patients with more functional impairment and psychiatric symptoms are more likely to have a shorter life expectancy [1]. Factors affecting MMSE in dementia patients include poor health, subjective memory impairment, hypertension, cardiovascular disease, and hearing impairment [2]. Low MMSE is reportedly associated with comorbidity and frailty [3]. Depression and sleep disturbances predict cognitive decline in dementia patients, and neuropsychiatric symptoms have been reported to influence cognitive decline 5 years after onset [4]. MMSE scores are important predictors of anxiety and apathy in dementia patients [5].

Factors that exacerbate the sense of caregiving burden include a worsening of the cognitive status of dementia patients, decreased functional capacity in daily life operations, and depression of caregivers with strong neuropsychiatric symptoms, all of which are associated with caregiver care burden [6]. In addition, prominent neuropsychiatric symptoms in dementia patients are reportedly associated with lower caregiver health-related quality of life, as reflected by vitality and mental health scores of caregivers [7]. To our knowledge, no study to date has examined whether caregiver burden is an independent predictor of MMSE in dementia patients.

The purpose of this study is to identify factors that affect MMSE in dementia patients.

Methods

Dementia patients receiving care at home and their caregivers aged ≥65 years were included in this cross-sectional study which examined caregiver factors affecting MMSE in dementia patients. MMSE testing is used for the early diagnosis of dementia and was performed on dementia patients in the present study [8, 9]. MMSE assesses cognitive function and has a maximum score of 30, with lower scores indicating lower cognitive function. An MMSE score <24 was defined as having suspected dementia (“1”), and a score ≥24 was defined as not having dementia (“0”).

The Zarit Burden Interview (ZBI) was used to assess a caregiver's sense of caregiving burden [10]. The maximum ZBI score is 88, with a score of ≥21 indicating a sense of care burden. Higher scores indicate a greater sense of caregiving burden, and a score below 21 indicated no sense of caregiver burden.

Statistical Analysis

Factors related to MMSE and caregivers were analyzed using Pearson's correlation coefficient. Logistic regression analysis was used to identify factors which affect MMSE in dementia patients. Caregiver factors, such as caregiver gender and ZBI, were used in the analysis.

This study was approved by the Nagoya University Ethics Review Committee.

Results

Table 1 provides a summary of subject characteristics. Roughly 55.8% of subjects were female. More than half of the caregivers (63.5%) had a ZBI score of ≥21, suggesting that they had a relatively high caregiver burden; 76% of dementia patients had an MMSE score <24 points, indicating that most patients had dementia.

Table 2 shows correlations between MMSE in dementia patients and caregiver factors. MMSE was correlated with caregiver gender (p=0.001), but not with ZBI (p>0.05).

Results of the logistic regression analysis, with MMSE in dementia patients set as the dependent variable, are shown in Table 3. ZBI was identified as a factor which affected MMSE of dementia patients (OR:1.063: 95%CI: 1.009-1.120). Caregiver gender was another factor which tended to, albeit non-significantly, affect MMSE in dementia patients (p=0.060, OR:5.592).

Table 1: Subject characteristics

	Mean	SD
Caregivers		
Sex, Female (%)	55.8%	
ZBI, ≥21 points (%)	63.5%	
Dementia patients		
MMSE: <24 points (%)	76%	

Table 2: Association between MMSE and caregiver factors in dementia patients

		MMSE	Caregiver Sex	ZBI
MMSE	r	1	0.416**	-0.251
	P		0.001	0.078

r: Pearson's correlation coefficient

Table 3: Factors affecting MMSE in patients with dementia by logistic regression analysis

	B	SE	Wald	P	Exp(B)	95% confidence interval	
						lower limit	upper limit
Caregiver gender	1.721	.917	3.524	.060	5.592	.927	33.729
ZBI	.061	.027	5.364	.021	1.063	1.009	1.120

B: Partial regression coefficient; SE: Standard error

Discussion

This study examined factors that affect MMSE in dementia patients. ZBI was identified as a factor that affects MMSE, MMSE was correlated with caregiver gender, and caregiver gender tended to affect MMSE.

In the present study, 76% of dementia patients had MMSE scores <24. In general, patients with low MMSE scores are in a state of cognitive loss and impaired functional abilities in daily living [11]. Subjects of the present study likely had cognitive decline and required assistance in their daily lives. The inability of dementia patients to be fully independent is predicted to have a significant impact on their caregiver’s sense of caregiving burden.

Problematic behaviors of dementia patients, such as aggression, screaming, and other disruptive behaviors, and a decline in the level of activities of daily living are factors that increase the burden of caregiving [12]. Many caregivers who participated in the present study had slightly higher ZBI scores and a slightly higher sense of caregiving burden. The low cognitive function of dementia patients may have contributed to the observed increase in the sense of caregiving burden.

MMSE in dementia patients was correlated with caregiver gender, but not with ZBI. Many studies on factors related to caregiver burden have reported emotional distress and a sense of caregiver burden among female caregivers [13, 14]. This is due to the fact that female caregivers tend to experience more psychological strain than male caregivers and are affected by the longer duration of caregiving [15, 16]. For male caregivers, age of the care recipient, social support, instrumental activities of daily living performed, and caregiving all impact health-influenced burden [17]. Since gender is a predictor of caregiving burden, it will be important to consider caregiving burden in light of gender differences. Furthermore, male caregivers tend to view caregiving work less emotionally than female caregivers [18]. However, male caregivers, like their female counterparts, also experienced depressive symptoms and low self-esteem [19]. These findings suggest that, as dementia progresses, MMSE scores will decrease and caregiving will become more difficult, and also highlight the importance of understanding the mental aspects of caregivers based on their gender and caregiving experience.

In this study, ZBI was identified a factor which affects MMSE in dementia patients. In general, MMSE is an independent factor related to a caregiver's sense of caregiver burden. One study reported that caregiver burden increases over time as dementia progresses [20]. This may indicate that a caregiver's mental health may no longer be adequately maintained in cases of prolonged care. Moreover, neuropsychiatric symptoms (e.g., agitation and activity disturbances) in dementia patients progress in parallel with the severity of cognitive decline [21]. Psychiatric symptoms in dementia patients also correlate with depressive symptoms in caregivers [22]. While the strongest determinant of caregiver burden is behavioral impairment, the effect of the degree of cognitive impairment on burden is important [23]. Psychological support for caregivers will need to match the symptoms and degree of dementia in their care recipients.

Caregiver burden is a predictor of a lower quality of life for caregivers [24]. Improving the lives of caregivers may have an indirect impact on dementia patients. It is also possible that a caregiver's sense of burden may impact the cognitive function of dementia patients. Our results suggest that caregivers need to reduce their sense of caregiver burden in order to prevent a decline in MMSE scores and to maintain and improve the cognitive function of dementia patients.

Another factor that showed a tendency to affect MMSE of dementia patients, albeit not significantly, is caregiver gender. Specifically, MMSE of dementia patients tended to decrease when they were cared for by male caregivers. Since most subjects of the present study were female caregivers, it will be important to clarify the extent to which male caregivers feel the burden of caregiving. A study that tracked neuropsychiatric symptoms of dementia patients reported an increase in dementia symptoms over a 3-year period and a substantial association between dementia severity and neuropsychiatric symptoms [25]. Moreover, male caregivers were willing to pay higher amounts for caregiving skills, and compared to male caregivers, female caregivers were more likely to have some or more caregiving skills. Furthermore, female caregivers were not willing to pay higher amounts for technology to assist in caregiving [26]. Most caregivers are family caregivers and tend to be female, but males such as sons and husbands fulfilling the caregiver role are becoming increasingly common. Male caregivers experience difficulties with balancing work, caregiving, and housework, and may be away from home during the day due to work. This is expected to result in dementia patients spending their days without access to daytime care, leading to the progression of dementia. The quality of care might also differ by gender because many men do not express their feelings and may be isolated in the community, which can be problematic and result in them receiving limited information about and support for caregiving. There is a need to increase support for male caregivers in terms of knowledge and skills related to dementia and balancing work and social activities, support in the community, and assessment and assistance regarding mental health to prevent their isolation.

Conclusions

ZBI was identified as a factor which affects MMSE in dementia patients, MMSE was correlated with caregiver gender, and caregiver gender was identified as a factor that showed a tendency to affect MMSE. It will be important to further research the importance of improving caregivers' mental health and comprehensive support with the aim of preventing their sense of caregiving burden from worsening. Our findings highlight the importance of reducing the sense of caregiving burden among caregivers in order to lessen the negative impact on the cognitive function of dementia patients.

Conflict of Interest

None to report.

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