THE CORRELATION BETWEEN MARRIAGE AND DEMENTIA IN ELDERLY AT THE WREDA SEJAHTERA ASSOCIATION (PWS) IN DENPASAR CITY

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ABSTRACT

Elderly individuals are considered more vulnerable to experiencing dementia due to the various changes they undergo in life, one of which is marriage. Certain marriage status may have a higher likelihood and risk of being associated with dementia. This research aims to provide a description of characteristics and identify the relationship between marriage and dementia among elderly at the Wreda Sejahtera Association (PWS) in Denpasar. This study employed a cross-sectional analytic design. Data were collected through face-to-face interviews and with MoCA-INA to evaluate characteristics and incidence of dementia among 88 elderly. Data were then analyzed using univariate and bivariate, and multivariate analysis. Of the 88 elderly, 9.1% had dementia where the majority were not with a partner (widow/widower). There was an association between dementia with marital status (p=0.000) and education (p=0.034). The risk of elderly with dementia is three times higher in widows/widowers than those who are still with their spouses. Odd ratio (OR) of elderly widow/widower was 30.608 (95%CI= 2.451-38.264). Marital status and age are risk factors contributing to the occurrence of dementia. Being unmarried or widowed/divorced can increase the likelihood of experiencing dementia, with this likelihood increasing as age advances. Preventive measures of dementia should be done as early as possible for divorced or unmarried people.

Keywords : Dementia., Elderly., Marriage

INTRODUCTION

Dementia is one of the most common health problems faced by elderly. Approximately, there are 10 million new dementia cases each year and in 2015 the amount of people suffering dementia was about 47 million people.[1] Data in 2016 showed that there were about 1.2 million cases of dementia in Indonesia, in which this number is expected to increase in 2030 to 2 million cases and double to 4 million cases in 2050.[2] According to research data in Java, the prevalence of dementia in rural areas on the island ranges from 7-16 percent, while roughly 3 percent in urban areas.[3] Based on a report from a dementia study conducted in 2018, the proportion of dementia cases in Bali reached 32.6 percent of 1,685 samples, or around 550 participants in the study.[4] The high number of dementia cases is directly proportional to the increasing number of elderly individuals every year. The number of indonesian elderly people in 2021 reached 29.3 million people or 10.82 percent of the total population.[5] This figure represents an increase of 2.48 million people compared to 2020 when the count stood at 26.82 million.[6]

High-risk factors for dementia are associated with individuals who are elderly, female, have lower levels of education, suffer from chronic diseases, experience depression, consume alcohol, smoke, and exhibit limited physical and social activities.[7] Certain marital statuses also make individuals more vulnerable to dementia. Meta-analysis results indicate that widowed or never-married individuals throughout their lives have a higher risk of dementia.[8] This is attributed to their lower social interaction compared to married individuals. Additional research suggests that unmarried men have a higher risk of dementia because they rely on their spouses as their trusted confidants.[9,10] In addition, divorced individuals are said to be more likely to develop chronic diseases and depression.[11] This is in line with research that found that people without a spouse or living alone tend to have a bad mood and thus show a high risk of dementia.[12]

The number of divorce cases in Indonesia has increased every year. Data in 2021, there were 447,743 divorce cases in Indonesia. This number has increased from the previous year by 53.50 percent.[13] In the same year, it was said that two out of five elderly people in Indonesia did not have a partner due to death, divorce, or not married. In addition, it was noted that elderly women who did not have a partner had a higher prevalence than elderly men.[5] The number of divorces in Denpasar City has also increased, tripling from the previous year.[14]

Given the rising incidence of dementia each year, coupled with the high divorce rates, the author intends to investigate whether there is a relationship between marital

status and dementia among the members of the Wreda Sejahtera Association (PWS) in Denpasar.

METHODS

This research has obtained permission from the Research Ethics Commission of Medical Faculty, Udayana University, Bali with ethical license No: 45/UN14.2.2.VII.14/LT/2023. This study employed a correlational analytic cross-sectional method. The research was conducted by collecting demographic data and asessing the incidence of dementia from February to March 2023 in the Wreda Sejahtera Association (PWS) Denpasar. The total sample that met the inclusion and exclusion criteria comprised 88 elderly. The inclusion criteria included PWS members present during the research, while the exclusion criteria encompassed subjects unwilling to participate in the study and those aged less than 60 years at the time of the research. Prior to data collection, subjects were presented with informed consent forms and, upon agreement, signed consent letters. Data were then collected through 10-15 minute in-person interviews.

The collected demographic data included basic information such as gender, education status, age, living environment, marital status, duration of divorce, economic status, health status, history of medication consumption, and duration of medication. Gender was categorized into male and female, while age was classified as 60-70 years old and over 70 years old. Education status included categories such as 'not attended school,' 'elementary school,' 'junior high school,' 'senior high school,' and 'university degree,' based on the subject's last formal education. Living environment was divided into 'living with family' and 'living alone.' Health status was categorized as 'having a chronic illness' or 'not having a chronic illness.' History of medication consumption was classified into 'not consuming medication,' 'using one type of medication,' and 'using two or more types of medication.' Marital status was categorized as 'married' when the subject's partner was still alive and they lived together, while 'widow/widower' was chosen when the subject did not live with their partner due to divorce or the death of their spouse. Duration of divorce, economic status, and duration of medication were treated as numerical data. The incidence of dementia was assessed using the Montreal Cognitive Assessment Indonesia (MoCA-INA) instrument. Subjects with MoCA-INA scores of 26-30 were categorized as 'normal,' scores of 17-25 as 'mild cognitive impairment' (MCI), and scores of ≤16 as 'dementia.'

The collected data were analyzed through univariate, bivariate, and multivariate analysis using the Statistical Package for the Social Science (SPSS) software version 26.0 for Windows. Univariate analysis was conducted to present the proportion of research variables in the study subjects. Bivariate analysis employed the contingency coefficient and Spearman analysis to test the correlations between variables and determine their level of significance ($\alpha = 0.05$). Variables were considered to have a significant relationship if the p-value was <0.05. Multinomial logistic regression analysis would be performed for the multivariate analysis after confirming the significance of variable relationships to identify specific differences between the study variables.

RESULTS

Based on the demographic characteristics of the study subjects (**Table 1**), more than half of the subject population were aged over 70 years (n=48; 54.5%), and the majority were female (n=66; 75%). The largest group of subjects had completed higher education (n=39; 44.3%), followed by those with a high school education (n=38; 43.2%). A total of 82 subjects (93.2%) resided with their families. The average income of the study subjects was Rp 3,136,000 ± 2,060,000, with the lowest income recorded at Rp 500,000 and the highest income at Rp 10,000,000.

The majority of subjects suffered from chronic diseases (n=57; 64.8%). A total of 63 subjects were regularly taking medication, with the majority taking ≥2 medications (n=39; 44.3%), and the average duration of medication consumption was 3.79 ± 3.59 years, approximately 4 years. The chronic diseases observed in our study subjects included depression, hypertension, stroke, diabetes, hypercholesterolemia, hyperuricemia, coronary heart disease, kidney failure, cataracts, glaucoma, osteoporosis, and cancer. Additionally, there were subjects undergoing treatment for tuberculosis and digestive disorders at the time of the study.

Subjects who were divorced/widowed or not living with their partners at the time of the study (n=58; 65.9%) outnumbered those who were married or still living with their partners (n=30; 34.1%). All study subjects who were not living with their partners were in this situation due to the death of their partners. The average duration of subjects being divorced or separated from their partners was 14 years, with the shortest duration being 2 years and the longest duration being 54 years.

Table 1. Demographic Characteristics of Research Subjects

Variable	Frequency (n)	Percentage (%)
Age (years)		
60-70	40	45.5
>70	48	54.5
Gender		
Male	22	25
Female	66	75
Education level		
Incomplete elementary school	3	3.4
Elementary	5	5.7
Junior High	3	3.4
High School	38	43.2
Higher education	39	44.3
Living environment		
With family	82	93.2
Alone	6	6.8
Income per month (million rupiah)		
Mean ± S.D.	3.13 ± 2.06	
Lowest	0.5	
Highest	10	
Median	3	
Health status		
With chronic disease	57	64.8
Without chronic disease	31	35.3
History of drug consumption		
No drug consumption	25	28.4
Consumption of 1 drug	24	27.3
Consumption of ≥2 drugs	39	44.3
Duration of drug use (years)		
Mean ± S.D.	3.79 ± 3.59	
Shortest	1	
Longest	23	
Marital status		
Still with partner (married)	30	34.1
Not with partner (widow/widower)	58	65.9
Duration not with partner (years)		
Average	13.74 ± 9.60	
Shortest	2	
Longest	54	
Incidence of dementia		
Dementia	8	9.1
MCI	58	65.9
Normal	22	25.0

Description: S.D.=Standard Deviation

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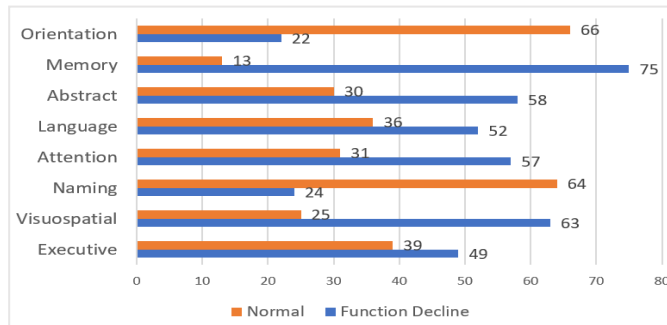
Figure 1. Distribution of research subjects based on MOCA-INA domain

A total of 8 subjects fell into the dementia category (9.1%). As shown in **Figure 1**, the majority of the study subjects experienced a decline in memory function (n=75). Additionally, more than half of the sample showed a decrease in visuospatial function (n=63), abstract function (n=58), attention function (n=57), language function (n=52), and executive function (n=49).

Based on bivariate analysis (**Table 2**), a significant relationship with a weak association was found between education and dementia (p=0.034; r=0.399). Furthermore, marital status and dementia exhibited a significant moderate relationship (p=0.000; r=0.467). The prevalence ratio (PR) value of 3.666, as observed in the table, indicates an increased risk of dementia in the elderly not living with their partners (PR>1). This suggests that the occurrence of dementia among elderly individuals not living with their partners is three times higher compared to those who are still together with their partners. However, there was no significant relationship between the duration of divorce and dementia (p=0.083). Other confounding variables also did not exhibit a significant association.

The results of the multivariate analysis using multinomial logistic regression have been performed on independent variables or risk factors that showed significant associations (p<0.05) with the dependent variable. This analysis is based on the cognitive status category 'normal.' Based on the results (**Table 3**),

it is evident that only marital status significantly influences the occurrence of dementia (p<0.05) in the population. The odds ratio (Exp (β)=30.608) reveals that research subjects who are not living with their partners have a 30 times higher likelihood of experiencing dementia compared to those who are still together with their partners. Similarly, the odds ratio (Exp (β)=17.491) demonstrates that subjects not living with their partners have a 17 times higher likelihood of experiencing Mild Cognitive Impairment (MCI) compared to those who are still together with their partners.

DISCUSSION

Dementia is a condition closely associated with the elderly population. Screening results using MoCA-INA among members of the Wreda Sejahtera Association (PWS) in this study revealed that 9.1% of the research population were experiencing dementia. This proportion is lower compared to previous research conducted in Bandung.[15] Moreover, surveys conducted in Bali also indicated a higher proportion in their samples, reaching 32.6%.[4] However, the proportion in this study aligns with the prevalence of dementia in rural areas on the island of Java, which ranges from 7% to 16%.[3] The occurrence of dementia is likely influenced by various factors. Significant factors associated with dementia incidence in this research are marital status and education.

Table 2. Bivariate Analysis of Independent Variables with Dementia

Variable	Incidence			Total	r	p
	Dementia (%)	MCI (%)	Normal (%)			
Gender					0.031	0.959
Male	2 (9.1)	15 (68.2)	5 (22.7)	22		
Female	6 (9.1)	43 (65.2)	17 (25.8)	66		
Age (years)					0.207	0.141
60-70	3 (7.5)	23 (57.5)	14 (35.0)	40		
>70	5 (10.4)	35 (72.9)	8 (16.7)	48		
Education level					**0.399**	**0.034**
Incomplete elementary school	2 (66.7)	1 (33.3)	0 (0.0)	3		
Elementary	1 (20.0)	4 (80.0)	0 (0.0)	5		
Junior High	0 (0.0)	2 (66.7)	1 (33.3)	3		
High School	1 (2.6)	26 (68.4)	11 (28.9)	38		
Higher education	4 (10.3)	25 (64.1)	10 (25.6)	39		
Living environment					0.248	0.056
With family	6 (7.3)	54 (65.9)	22 (26.8)	82		
Alone	2 (33.3)	4 (66.7)	0 (0)	6		
Economic status					0.162	0.132*
Health status					0.149	0.366
With chronic disease	7 (12.3)	36 (63.2)	14 (24.6)	57		
Without chronic disease	1 (3.2)	22 (71.0)	8 (25.8)	31		
History of drug consumption					0.215	0.374
No drug consumption	1 (4.0)	15 (60.0)	9 (36.0)	25		
Consumption of 1 drug	3 (12.5)	18 (75.0)	3 (12.5)	24		
Consumption of ≥2 drugs	4 (10.3)	25 (64.1)	10 (25.6)	39		
Duration of drug use					0.207	0.104*
Duration not with a partner					0.719	0.083*
Marital status					**0.467**	**0.000**
Still with partner	7 (12.1)	46 (79.3)	5 (8.6)	58		
Not with partner	1 (3.3)	12 (40.0)	17 (56.7)	30		

Table 3. Multinomial logistic regression test results

Cognitive status		β	S.E.	Wald	df	Sig.	Exp (β)	95% CI for Exp (β)	
								Lower	Upper
Dementia	*Intercept*	-5.849	2.211	7.001	1	0.008			
	Marital Status	3.421	1.288	7.053	1	0.008	30.608	2.451	38.264
	Incomplete elementary school	19.094	1.359	197.281	1	0.000	1961460 35.102	1365889 8.172	2816718 200.961
	Elementary	14.468	1015.615	0.000	1	0.989	1920386 .344	0.000	.
	Junior High	-16.483	2309.196	0.000	1	0.994	6.945E-8	0.000	.
	High school	-2.116	1.287	2.705	1	0.100	0.120	0.010	1.500
	Higher education	0	.	.	0	.	.	.	.
MCI	*Intercept*	-3.033	0.940	10.404	1	0.001			
	Marital Status	2.862	0.683	17.559	1	0.000	17.491	4.587	66.697
	Incomplete elementary school	16.705	0.000	.	1	.	1797730 4.999	1797730 4.999	1797730 4.999
	Elementary	14.061	1015.614	0.000	1	0.989	1277729 .308	0.000	.
	Junior High	-1.997	1.407	2.015	1	0.156	0.136	0.009	2.139
	High school	-0.618	0.651	0.901	1	0.343	0.539	0.150	1.931
	Higher education	0	.	.	0	.	.	.	.

Description: CI=convidence interval, df=degree of freedom

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The results of a meta-analysis conducted by Sommerlad *et al.*, (2018) indicate that the study design significantly influences the estimation of dementia risk. To our knowledge, only two earlier studies have assessed marital status in relation to dementia incidence, one in Jakarta and one in Bandung. In the Jakarta study conducted by Singgih *et al.*, (2020) using a cohort study design, it was shown that being single has a protective effect on dementia incidence. Conversely, a cross-sectional study in Bandung by Janaris *et al.*, (2020) did not find a significant correlation between marital status and dementia incidence. In contrast to our research at PWS, which demonstrates a significant association between marital status and dementia incidence, wherein dementia occurrence among elderly individuals not living with their partners is three times higher than among those still together with their partners. Furthermore, regression analysis reveals that research subjects not living with their partners have a 30-fold higher likelihood of experiencing dementia compared to those who are still with their partners.

Our study in Bali and the study in Bandung yielded contrasting results despite having similar study designs and some shared subject characteristics. The first shared characteristic is that the majority of subjects in both Bandung and our study live with their families. Additionally, the second similarity is that subjects are engaged in social activities. In the Bandung study, social participation emerged as the most dominant risk factor for dementia. In our research location, activities are held twice a week. However, our study did not examine social participation as a factor. The majority of subjects could not recall the frequency of their attendance at PWS activities, and there is no attendance list maintained by the PWS organization.Although the findings of the study in Bandung indicated that children and families can provide emotional and social support to the elderly, these results differ from our subjects' experiences of loneliness and depression, even when residing with their families. Previous research within the PWS also revealed that 6.7% of PWS members suffer from mild depression.[17]

Loneliness, in this context, is a subjective experience triggered by a situation in which an individual feels isolated or alone, which can burden the person.[18] Some individuals may experience loneliness even when surrounded by family and friends. The preference for elderly family members to live together is influenced by cultural factors. Previous research has shown that Indonesian society continues to hold a strong commitment to caring for their elders, where the elderly are considered to possess vast experience and wisdom, believed to hold a significant position and role within the family. However, this cultural perspective has shifted, evident in behaviors reflecting a diminished appreciation of the elderly's presence in the home, declining respect, attention, affection toward the elderly, and a tendency to delegate responsibilities to others.[19]

The reason elderly individuals in our study live with their families, particularly with their children, is primarily due to economic considerations. According to Wijaya & Anastasia, (2021), rising housing prices have made it challenging for the younger generation to purchase homes, a situation similar to that faced by the children of the elderly subjects in our research. Another reason is rooted in the patriarchal culture observed in Bali, where sons are expected to carry on the family lineage or caste, leading them to live with their parents, along with their spouses and children. Living with sons-in-law and grandchildren often results in emotional detachment caused by unresolved conflicts, a lack of expressive ability, and a failure to engage in deep communication.[21] This is also evident among the elderly in our study, who frequently express feelings of isolation and being left behind by their families, even when living under the same roof. Such circumstances can impact the quality of relationships, which plays a crucial role in feelings of loneliness.[22] High levels of social interaction within a relationship result in active communication. This communication can stimulate brain neuroplasticity and provide more frequent cognitive stimulation, which, in turn, may help prevent neuropathological damage.

Other variables examined in this study, such as living environment, history of chronic illnesses, medication use and its duration, age, gender, and economic status, did not exhibit a significant relationship with dementia incidence. However, educational level is said to have an influence on dementia occurrence. Individuals who have received education up to the university level are considered to have protection against dementia.[23] Higher education can expand one's social network, stimulating cognitive activity and potentially safeguarding against dementia.[24]

In this study, we found a significant relationship between educational level and dementia incidence, but after regression analysis, this association did not have a significant impact compared to marital status. Education can influence cognitive skills developed early in life, and these skills may have a long-term impact on cognitive function in old age. However, there is a complex and potentially negligible relationship between education and age-related cognitive decline. This condition may arise because individuals differ in their information processing, resulting in varied cognitive effects even when they have the same educational background.[25]

CONCLUSIONS AND SUGGESTIONS

Elderly individuals at the Wreda Sejahtera Association (PWS) in Denpasar City, primarily over 70 years old, well-educated, living with family, and with an average income above three million Indonesian Rupiahs, face a high prevalence of chronic diseases and prolonged medication use. The study revealed a 9.1% dementia incidence, with a significant link between marital status and dementia. Those not living with their partners had a threefold higher dementia risk, but the duration of separation showed no such correlation. Education was significantly associated

with dementia but did not affect the marital status-dementia link.

Proactive measures are needed to address dementia among the elderly at PWS Denpasar. Routine cognitive screening by the Social Services Department and collaboration with health organizations can enable early intervention. Further research by academics is essential to understand the factors influencing dementia in this population.

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CONFLICT OF INTEREST

The authors disclose that research was carried out without any financial or commercial ties that might be seen as having a conflict of interest.

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