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RISK OF DEMENTIA AND COMMUNITY-BASED PATIENT SAFETY REGARDING HEALTH IN THE ELDERLY WOMEN

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ABSTRACT
Multimorbidity is a challenge in elderly women's health. The increased risk of adverse health outcomes associated with frailty is related to patient safety issues, which is need broad community involvement to improve patient safety. This study aimed to describe the cognitive function of menopause women and describe the community empowerment regarding the community-based patient safety. This study was descriptive cross-sectional survey used MMSE, MOCA, and WHO-QOL brief questionnaire. The study participants were conveniently collected from 98 elderly women in nursing home and community in Semarang. A mixed methods analysis of patient safety incidents in the community related to older adults including the basic descriptive statistics and the differences of cognitive function and quality of life after giving the intervention. 87% of women are at risk for mild dementia, with a moderate quality of life for 60%. 73.5% (MMSE) and 71.4% (MOCA-INA) respondents were at mild to moderate level of memory impairment. Community-based doodle art therapy was significantly effective to improve memory index and quality of life. Patient safety that is often reported in female patients is associated with decreased cognitive function. Patient and community involvement can positively influence health outcomes.

Keywords: community; dementia; doodle art therapy; patient safety; women health

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INTRODUCTION

The aging population has the impact of increasing the need for special health services for the elderly. Health problems lead to epidemiological transitions in non-communicable diseases. In this case, aging is a process that is part of life and lasts from conception in the womb to throughout life. One of the health problems that occur related to the aging process, namely the decline in cognitive function is dementia. Dementia is a neurodegenerative syndrome caused by chronic and progressive disorders accompanied by decreased brain function (Mendrofa et al., 2020).

Dementia is indicated by cognitive decline and disability in body functions. Dementia is the fifth leading cause of death and disability, with Alzheimer's disease (AD) being the most

common cause of dementia. Several years before the onset of AD, AD-associated neuropathological changes are seen in the brain, which may be accompanied by cognitive decline. Therefore, patients with early cognitive symptoms are at increased risk of dementia (Conde et al., 2021). Mild Cognitive Impairment (MCI) is experienced by a person with objective cognitive deficits in neuropsychological tests and maintaining functional independence for activities of daily living (Conde et al., 2021). MCI is associated with a nine-fold increased risk of dementia compared with the general population. Identification of predisposing factors and triggering neurobiological mechanisms underlying early cognitive decline can contribute to the development of preventive interventions against dementia risk (Conde et al., 2021). The risk factor for dementia is greater for women. This is related to the life expectancy of women which is higher than that of men. The number of women is greater than that of men in the elderly group. In 2020, the sex ratio of the elderly population is 84.04, which means the ratio of elderly women to elderly men is 10 to 8 (BPS, 2021).

In addition, one of the changes that occur with the aging process in women is menopause. Menopause is a transitional process in women that occurs from the productive period to the non-productive period (Tsuraya et al., 2018). Menopause occurs when a woman has not had her period for 12 months without any intentional biological or physiological cause. Menopause is related to estrogen which plays an important role in the neurobiology of cognitive processes and nerve function. Menopausal transition is associated with cognitive decline although the relationship between decreased estrogen levels at menopause, effects of hormone therapy (HT), and risk of dementia is still under study (Conde et al., 2021; Edwards et al., 2019; Kuh et al., 2018). In line with the National Research Master Plan which views the condition of the demographic bonus in Indonesia as a challenge in health services, as well as the field of nursing research at Karya Husada University Semarang, this research focuses on degenerative diseases, especially in the climacteric period. The problem of dementia experienced by the elderly, especially in women's health, is also associated with patient safety, which is a concern for patients in the community. The community needs to be involved in being a support system for the elderly. Considering the relevance of the problem and efforts to contribute to the existing literature, and referring to the strategic plan of Karya Husada University in optimizing research according to the needs of development priorities, this study aims to describe the cognitive function of menopause women in Semarang and describe theories that support patient partnerships and community empowerment regarding the community-based patient safety.

METHOD

This study was a descriptive cross-sectional survey linking cognitive function and dementia risk with postmenopausal women's demographics. Observation or measurement of research variables is carried out in a predetermined time. The study participants were conveniently collected from 98 elderly women in nursing home and community in the work area of the Semarang City Health Office which were randomly selected from March – November 2022. The study was continued with a community-based pilot project as a quasi-experimental without a control group through doodle art therapy intervention in 4 therapy sessions conducted in groups.

Women aged 45-65 years, 12 consecutive months of amenorrhea, in the phases of menopause (peri-, pre-, and post-menopausal), and able to communicate well were included in this study. Menopausal age women who have a history of physical trauma that causes cognitive function problems, premature menopause due to surgery (surgical menopause) such as oophorectomy, medical menopause, received radiation therapy/chemotherapy, and have a history of mental

disorders were excluded from this study. The research has passed the ethical test by the Research Ethics Committee of Karya Husada University Semarang No. 005/KEP/UNKAHA/SLE/VI/2022. The instruments used in the study were informed consent, demographic questionnaire, MMSE, MoCA, and WHO-QOL. The instrument is a standard instrument so it does not require validity and reliability tests.

MMSE

The MMSE is a test that covers language, memory and calculation. Maximum score of 30 points with questions covering time orientation (5 points), place orientation (5 points), registration (3 points), attention (5 points), recall (3 points), language (2 points), repetition (1 point), ability to follow complex instructions (3 points). An MMSE score below 24 indicates a state of dementia or decreased cognitive function (Luthfiana & Harliansyah, 2019).

MoCA – Ina

MoCA-Ina is used to assess cognitive function, especially short term memory. The Indonesian version of the MoCA cognitive examination instrument has been validated and is known as the MoCA-Ina. This assessment includes eight stages, namely visuospatial/executive abilities (understanding dimensions and shapes), naming (naming animal pictures), memory (memory measurements), attention (playing back numeric rows), language (ability to use language in sentences), abstraction (ability to use abstracts), assessing the similarity of nouns, delay recall (ability to memorize words without instructions), and orientation (orientation ability to understand year, month, day, date, place, and city (Akbar et al., 2019). This is the same as the previous test which showed that Moca-Ina was valid and reliable for cognitive examination (validity test: $r = 0.529$ and $p = 0.046$; reliability test $r = 0.963$ and $p = 0.000$) (Panentu & Irfan, 2013).

WHO-QoL

QoL is defined by The World Health Organization (WHO) as individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. Instruments to measure QoL (WHOQOL-100 and WHOQOL-BREF) were developed by the WHOQOL Group in 1995. Skevington et al. 4 reported that the WHOQOL-BREF self-assessment is a sound and valid cross-cultural assessment. WHOQOL BREF has been translated into Indonesian by Ratna Mardiati, Satya Joewana, Hartati Kurniadi, Isfandari, and Riza Sarasvita. In addition, the questionnaire was revised twice (in 2014 and 2016) by Fredrick Dermawan Purba. This questionnaire consists of 4 domains, namely the physical domain, psychology, social relations, and the environment. WHOQOL-BREF for the elderly in Indonesia is a valid and reliable instrument for measuring the quality of life in the elderly (Gondodiputro et al., 2018). A mixed methods analysis of patient safety incidents in the community related to older adults was conducted. Analisis univariat dilakukan untuk mendapatkan gambaran statistik deskriptif dari masing-masing variabel termasuk karakteristik responden. Spearmen's Rank Correlation Test was used to analyze the correlation of cognitive function with the quality of life of respondents. After giving the intervention, cognitive function, level of independence and quality of life were measured again and seen the difference. After the normality test, differences in cognitive function before and after treatment were analyzed by the Wilcoxon Signed Ranks Test, while the quality of life was analyzed by paired t-test.

RESULTS

Descriptive characteristic

A total of 98 respondents participated in this study. Table 1 shows the characteristics of the respondents. The analysis using descriptive statistics on the results of the MMSE and MOCA screening is shown in Table 2, and the quality of live is shown in Table 3.

Table 1.
Characteristics of Respondents (n=98)

Characteristics	f	%
Age		
45-59	82	84
>60	16	16
Education		
Primary school	33	33.8
High school	65	66.2
Post-menopause syndrome		
1 – 5 years	36	34
6 – 10 years	47	45
11 - 15 years	12	12
>15 years	7	7

Tabel 2.
Memory index screening (n=98)

MMSE test				
Age	Normal		Mild to moderate memory impairment	
	f	%	f	%
45-59	15	15.3	21	21.4
>60	11	11.2	51	52.0
MOCA-INA test				
45-59	13	13.3	23	23.5
>60	15	15.3	47	48.0

The results of the analysis show that cognitive function is significantly related to quality of life with a positive correlation (correlation coefficient 0.779, p-value 0.001; Table 3). The higher or better the cognitive function, the better the quality of life.

Table 3.
Relationship between cognitive function and quality of life (n=98)

			Kategori MMSE	QoL
Spearman's rho	Kategori MMSE	Correlation Coefficient	1.000	.779**
		Sig. (2-tailed)	.	.000
		N	142	142
	QoL	Correlation Coefficient	.779**	1.000
		Sig. (2-tailed)	.000	.
		N	142	142

**. Correlation is significant at the 0.01 level (2-tailed).

Cognitive Function before and after Doodle Art Therapy

The minimum and maximum scores of cognitive function after the intervention showed improvement, while the standard deviation decreased after the intervention (Table 3). The results showed that there was a significant difference in cognitive function before and after doodle art therapy, p value < 0.05 (Table 4).

Table 3.
The mean of cognitive function (n=98)

Statistic	Minimum	Maximum	Mean	Deviation Standard
Before	5	29	24.64	5.916
After	9	30	25.72	5.397

Table 4.
Statistik Wilcoxon Signed Ranks Test (n=98)

	Postmmse - premmse	Post-pre Moca
Z	-4.310	-3.720
Asymp. Sig. (2-tailed)	.000	.000

Quality of Life

25 respondents took doodle art therapy as a community-based therapy pilot project. Before participating in doodle art therapy, the majority (60%) of respondents had a moderate quality of life, and 16% had a good category. The percentage of respondents with a good quality of life increased after therapy (66,7%) (Table 3).

Table 3.
QoL before and after doodle art therapy (n=98)

	Low		Moderate		Good		Total	
	f	%	f	%	f	%	f	%
Before	6	24	15	60	4	16	25	100
After	0	0	9	33,3	16	66,7	25	100

Statistical paired t-test showed a significant difference in quality of life scores before and after therapy, *p* value <0.05 (Table 4).

Table 4.
Paired-T test of QoL (n=98)

	Mean	SD	P	Mean & SD
Pre	82.83	9,998	0,004	12,92&12,39
Post	95,75	12,6		

DISCUSSION

Women Health

Health is not merely the absence of disease or infirmity, but a state of complete physical, mental and social well-being. Today, the global health system draws up plans based on the health of families and women. Multimorbidity in elderly women demands holistic services. Health screening efforts are needed to identify health care needs for women, especially in the elderly (Stieglitz et al., 2022). The aging process in women is associated with a natural occurrence called menopause, the main characteristic of which is the inability to fertility and reproduction (Namazi et al., 2019).

Menopause is the permanent cessation of menstruation due to the loss of ovarian follicular activity. During menopause, the ovaries stop producing the hormones estrogen and progesterone. Natural menopause occurs when a woman experiences 12 consecutive months of amenorrhea that is not related to surgical treatment or drugs. The average age of natural menopause is between 50 and 51 years (El Khoudary et al., 2019). Ovarian estrogen production begins to decline 1 or 2 years before menopause and reaches a steady nadir about 2 years after the last menstrual period. Serum concentrations of estradiol and estrone, the main circulating oestrogens, are very low after a woman is no longer reproductive (Chantalat et al., 2020).

Estrogen affects brain function through effects on blood vessels and the immune system. Two classes of intracellular estrogen receptors are expressed in specific regions of the human brain. Other receptors located on the plasma membrane help regulate intracellular signaling cascades and mediate rapid effects that do not involve genome activation (Berent-Spillson et al., 2018; Kuh et al., 2018; Pertesi et al., 2019). Many of the actions of estrogen are potentially relevant to the cognitive changes that occur after menopause, but most of their clinical implications remain unclear. Estrogen increases synaptic plasticity, neurite growth, hippocampal neurogenesis, and long-term potentiation. The latter is a physiological process involved in the formation of episodic memories. Estrogen protects against apoptosis and against nerve injury in a variety of experimental settings, including toxicity induced by excitatory neurotransmitters, -amyloid, oxidative stress, and ischemia (Weber et al., 2014).

Estrogen affects several neurotransmitter systems, including acetylcholine, serotonin, noradrenaline, and glutamate. Acetylcholine is important in memory processes. Cholinergic neurons in the basal forebrain express estrogen receptors, and estrogen enhances cholinergic function after ovariectomy. These neurons are specifically affected by the pathology of Alzheimer's disease. Other estrogen actions are proinflammatory and anti-inflammatory. The prothrombotic nature of some estrogens can cause cerebrovascular disease, and vascular pathology increases the severity of dementia in the presence of Alzheimer's pathology (Edwards et al., 2019).

Cognitive Disorder

Cognitive activity includes processes for identifying, selecting, interpreting, filtering, and using information that makes sense. There are four classes of cognitive functions, namely reception functions, memory and learning functions, thinking functions, and expressive functions. These functions can ultimately be measured based on 4 cognitive aspects, namely attention, memory, language, and executive function (Djajasaputra & Halim, 2019). Problems related to cognitive decline are the weakening of memory of something (senile), and it is difficult to socialize with the surrounding community (Listia Dwi Febriati, 2019). Cognitive impairment is a disorder associated with increasing age. This disorder causes a decrease in brain function related to the ability to pay attention, concentrate, calculate, make decisions, reasoning, and abstract thinking. Dementia is a decline in cognitive or intellectual function that can interfere with the ability to carry out activities in daily life (Hatmanti & Yunita, 2019).

One of the most common causes of dementia is Alzheimer's disease (AD). AD is characterized by dementia which usually begins with memory loss, a decrease in the ability to recognize something which slowly gets worse due to a disturbance in the brain that is progressive or slowly until finally the patient becomes unable to remember and recognize something. Other signs include confusion, poor judgment, impaired speech, agitation,

withdrawal, and hallucinations (Hidayatul & Sinuraya, 2016).

Dementia in menopausal women

Cognitive decline is a common complaint in women during the menopausal transition (Conde et al., 2021; El Khoudary et al., 2019). Complaints of impaired memory are associated with the perimenopausal period compared to the pre- or postmenopausal period (Unkenstein et al., 2016). The Women's Health Initiative Memory Study (WHIMS) recorded an incidence of mild cognitive impairment (MCI) of 4.5% in 6376 postmenopausal women evaluated for 5.4 years. However, the relationship between MCI and menopausal factors is still little researched (Conde et al., 2021).

In line with the aging process, cognitive function during postmenopause tends to decrease compared to during pre-and perimenopause (Weber et al., 2014), including cognitive domains that are assumed to be more sensitive to changes in estrogen levels (Conde et al., 2021). Various studies show that adequate estrogen has an impact on cognitive function that remains good (Kuh et al., 2018). Neuropsychological testing in postmenopausal found better in women with younger age of menarche, older age of menopause, age at first childbearing more than 20 years, and longer reproductive period (Conde et al., 2021). Although the relationship between reproductive length and the risk of cognitive decline or dementia remains controversial, various population-based studies have shown an increased risk of dementia of up to 23% due to older age of menarche, early menopause, and shorter reproductive periods (Gilsanz et al., 2019; Yoo et al., 2020). Several studies suggest that decreased estrogen levels during the menopausal transition impair brain bioenergy due to mitochondrial cytochrome oxidase dysfunction associated with decreased cerebral metabolism, -amyloid deposition, synaptic loss, and cognitive decline (Conde et al., 2021).

Doodle Art Therapy

Doodle art as a work of art in this study by applying color. In doodle art, objects that are often used are images of monsters, plants, animals, and so on. Doodle art as part of art can be a therapy that provides sensory and cognitive stimulation for clients who experience neurological disorders such as brain injuries, strokes, and brain tumors. Melih Art therapy can stimulate sensory and motor functions to activate the part of the brain that causes neurocognitive disorders. Similarly, the application of this therapy in efforts to prevent dementia or improve cognitive function. (Rickles, 2018). Several studies have shown that the limbic system, which is interconnected with the prefrontal cortex, can be strengthened by identifying colors and shapes, as well as painting. Meanwhile, the prefrontal cortex can be trained by trying to solve abstract problems about how the paint will get into the brush, how much paint is used, and then how to get the paint onto the paper and fill in the shape (Rickles, 2018).

Community-based patient safety

Incidents that result in minor or non-hazardous harm have the potential to contribute to more serious harm if ignored or action is not taken to address them. While serious patient safety incidents have been a significant driver for improving patient safety,6 it has also been noted that incidents that result in non-serious harm should not be ignored. Elderly patients are one of the patients who need special attention. Changes in the elderly, require nurses to provide quality health services. In this case, community involvement in understanding safety in the elderly is a strategy in increasing patient safety efforts in the elderly (Astarini et al., 2021). One of the intervention strategies carried out is through a group process by forming a self-help group to improve cognitive function in elderly women. This group is a collection of

elderly women so that it is suitable for secondary prevention in community nursing. Secondary prevention emphasizes early diagnosis and action to slow down the disease process (Stanhope M. & J., 2013). Doodle art therapy is carried out in groups by inserting joint relaxation. The positive effect obtained is the awakening of the elderly's expectations because they realize that other people experience the same problem. This group is also a forum for sharing information, not only health information related to women's health, especially related to the aging process, but also sharing experiences and group therapy. (Ashraf et al., 2019).

CONCLUSION

Elderly women tend to face a high risk of frailty related to cognitive impairment. In tihis case, the community-based patient safety in dwelling community need attention for health care service in community. Community involvement is widely supported but poorly defined as a strategy to improve patient safety. Patient and community involvement can positively influence health outcomes. Community involvement can improve patient safety. Relying on models from other disciplines such as public health, adequate knowledge and application of the principles of community engagement are essential for this approach to be effective.Keywords: community, dementia, patient safety, women health.

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