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## The Benefits of Temu Mangga (Curcuma Mangga Val) in Cognitive Functions of Elderly

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### Abstract

The objective of this study was to investigate the benefit of Temu Mangga extract (Curcuma Mangga Val) with cognitive function test using Montreal Cognitive Assessment- Indonesian version (MoCA-Ina -Registry MoCA-Ina / stroke registry-INA 2012) in Elderly. This Clinical trial study was conducted using a double-blind, randomized controlled trial, pre and post-test group design in 85 female participants from Panti Wreda Nursing Home in Jakarta. A total of 83 participants who followed the study to the end. 43 participants were administered the Temu Mangga Capsule (TM) group 3x500 mg/day for 30 days. Results: Mean score of MoCA-Ina in TM group increased by 2.37 from  $23.93 \pm 3.73$  to  $26.30 \pm 3.92$  with Wilcoxon test p-value = 0.000, and in the control group with 40 participants increased by 2.55 from  $23.58 \pm 4.60$  to  $26.13 \pm 4.56$  with Wilcoxon test p-value = 0.000. Mann-Whitney test results in both groups p > 0.05. Conclusions: There was an increase in each treatment groups and control groups with significant Moca-Ina values, but between the two groups did not show significant difference changes. Psychological factors such as attention and hope will become healthier are a strong factor in this study.

**Keywords:** MoCA-Ina; Elderly; Temu Mangga; Cognitive Functions; Nursing home.

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## **1. Introduction**

Old age is a process whereby every individual will experience it; the aging process will cause the coming of limitations and diseases. This situation causes the elderly to be unproductive, especially when accompanied by mental function impairment. Mental disorders of short-term memory loss commonly known as dementia of this condition often cause healthy elderly to become physically independent and depend on the people around him [1]. According to Japan's central statistics agency, the number of the elderly aged  $\geq 60$  years in 2012 has reached 41,039 million (32.18%), which is far beyond the world average where 2050 will reach 2008 million (22%) [2]. Asian Population Studies in Indonesia: The number of people aged  $\geq 65$  years in 2015 reached 14.049 million people and in 2050 will reach 62,812 million people (21.8%) almost a quarter of the total population of Indonesia [3]. Increasing the elderly population especially in Indonesia should be anticipated degenerative disease which will significantly increase in the future. Dementia disease often associated with the Elderly, and most commonly the type of Alzheimer Dementia (DA) reaches 60-80% of cases of dementia, DA brain disorders have started since 20 years before the initial symptoms appear [4]. In DA disease is often accompanied by behavioral disorders known as BPSD (Behavior and Psychological Symptoms of Dementia), this situation will make it more difficult for Elders to interact with their friends [5, 6]. The current treatment is not satisfactory and expensive, so it is necessary to quickly find an effective and less costly alternative therapy to cope with the increasing cases of DA and BPSD [7]. Indonesia is rich in various crops, so Herbal treatment is relatively more affordable to be a choice for Dementia therapy. Temu Mango that many in Indonesia have an antioxidant effect and inhibit the formation of A $\beta$  plaques, so it has potential as an alternative therapy in cases of Dementia [5, 8, 9].

## **2. Materials and Method**

### ***2.1. Collection of Samples***

This clinical trial study was conducted using a double-blind, randomized controlled pre and post test group design study. In this research, Temu Mangga extract was administered by administrative personnel and distributed by a nurse working in the nursing home. The administrative staff is the only person who knows the bottles containing the Temu Mangga capsule or placebo. The measurement was done with MoCA-Ina questionnaire before and after 30 days of treatment. Inclusion criteria were all elderly at Nursing Home 60-90 years of age, and MoCA-Ina examination is possible. Exclusion Criteria were psychiatric examinations cannot be performed, e.g., Total immobilization with severe cognitive regression, unable to speak and communicate and Elderly with depression, insomnia, anemia, infections that can not overcome with therapy. The study participants were 85 participants of senior women between 60 and 90 years old who came from a nursing home in Jakarta. Participants were examined to see the effectiveness of Temu Mangga extract in improving the cognitive function of the Elderly. The cognitive function of the Elderly reviewed using the MoCA-Ina questionnaire stems from a stroke of the INA-2012 registry, the University of Indonesia's Neurology department. Temu Mangga extract capsules (@ 500 mg/capsule) and Maizena (Controls) (@ 500 mg/capsule) were obtained in collaboration with PT Biofarmaka Indonesia (BIOFARINDO), a company under the Center for Biopharmaceutical Studies - Bogor Agricultural University. Then 85 participants of senior women who followed this study examined pre and post-cognitive function with MoCA-Ina questionnaire (consist of 7 items:

visuospatial, naming, attention, language, abstraction, delay memory, orientation). Healthy cognitive function when MoCA-Ina value  $\geq 26$  and cognitive function impairment when value  $< 26$ . The capsule of Temu Mangga extract is given for 30 days with a dose of 3x500 mg/ capsule/day. Participants consist of 2 groups: Group given extract capsule Temu Mangga (TM) and a control group were given a placebo. MoCA-Ina divided into normal cognitive function  $\geq 26$  and cognitive impairment  $< 26$ .

## 2.2. Data Analysis

Statistical analysis was performed using SPSS 17.0 software (SPSS, Inc., Chicago, IL, USA). The statistical analysis looks for the relationship between Temu Mangga capsule extract and cognitive function (MoCA-Ina) and its items (visuospatial, naming, attention, language, abstraction, memory delay, orientation).

## 2.3. Ethical Clearance

Ethical clearance: Written informed consent was obtained from all research participants and recommendation of ethical approval from Hasanuddin University, Makassar Indonesia with a number: 130 / H4.8.4.5.31 / PP36-KOMETIK / 2017.

## 3. Results

To determine the number of participants who experience cognitive dysfunction, examination, and analysis with MoCA-Ina questionnaire. A total of 85 participants conducted data collection of patient characteristics and initial examination MoCA-Ina. The results of the study table 1 in 85 participants of women with an average age of 75.3 years and the average length of education 11.4 years, obtained MoCA-Ina  $\geq 26$  amount of 34 (40%) and MoCA-Ina  $< 26$  amount 51 (60%).

**Table 1:** Demographic and Variable Characteristics of Research Participants

Participants (n)	Average age (years)	The average length of education (year)	Married (n)	Unmarried (n)	MoCA-Ina $\geq 26$	MoCA-Ina $< 26$
Participants at the beginning (85)	75.3	11.4	69	16	34	51
Participants at the end (83)	75.6	11.4	68	15	34	49

In 83 elderly women participants who followed the study to completion, divided into two groups given the capsule Temu Mangga (TM) and the control group (placebo). Temu Mangga extract capsules and placebo were

administered three times/day @ 500 mg/capsule for 30 days, further examination of MoCA-Ina pre and post gave Temu Mangga and placebo. Then an analysis of the relationship between TM group and control with MoCA-Ina was performed.

From table 2 it can be seen that Wilcoxon test results in each group increased Moca-Ina score significantly showed  $p < 0.05$ . In the TM group increased by 2.37 from  $23.93 \pm 3.73$  to  $26.30 \pm 3.92$  and in the control group increased by 2.55 from  $23.58 \pm 4.60$  to  $26.13 \pm 4.56$ . Mann-Whitney test results did not show any difference between the two groups ( $p > 0.05$ ).

**Table 2:** Comparison of Moca-Ina score changes between the two groups

Groups	Moca-Ina Scoring			p*	p**
	Before	After	Change		
TM(n=43)	23.93±3.73	26.30±3.92	2.37(-4/9)	0.000	0.661
Control(n=40)	23.58±4.60	26.13±4.56	2.55(-4/9)	0.000	

Description: \* Wilcoxon test \*\* Mann-Whitney test

Considering the change of the two groups, the difference in the Moca-Ina score is between -4 and 9; means, not all have improved; also there is a decrease. Therefore, a specific test conducted with three categories of change; increased. Fixed and decreased. Next Chi-square test results obtained in table 3.

**Table 3:** Comparison of distribution categories of Moca-Ina score change between the two groups

Groups	Category changes Moca-Ina Score			P*
	decreased	Fixed	<u>Increased</u>	
TM(n=43)	4(9.5%)	6(14.0%)	33(76.7%)	0.154
Control(n=40)	3(7.5%)	1(2.5%)	36(90.0%)	

As shown in table 3 the increase of MoCA-Ina score in both groups: control (90.0%) and TM (76.7%). But not statistically significant  $p = 0.154$ .

#### 4. Discussion

In this study, the percentage of impaired cognitive function was 51 (60%) of the participants. A similar

percentage study conducted by Iqbal Al Rasyid and his colleagues conducted a survey with MoCA-Ina in the Elderly in Padang Panjang Timur District of Padang Panjang City with a percentage of 66% with cognitive function disorder [12]. Temu Mangga extract was obtained by increasing the MoCA-Ina score in TM 2.37 p-value = 0.000 group, and in the control group 2.55 with p-value = 0.000, but both groups found no significant relationship p-value = 0.661. The MoCA-Ina score was then scaled up in both groups where the increase in the control group (90.0%) was higher than in the TM group (76.7%). But in both groups, there was no significant relationship p 0.154. The old aging process will reduce the physical and mental conditions so that will affect and limit the daily activities. Reduced awareness and adaptability to this aging process will change the mood, behavior and social events. Older adults living in a nursing home where families rarely visit will cause feelings of loneliness. Unnoticed and useless feelings [13]. Studies found attention given during the research and the hope of recovery may affect the results of MoCA-Ina score [14-16].

## **5. Conclusion**

This study found MoCA-Ina scores improved both in the treatment groups and control groups were thought to be due to psychological effects. Psychological factors such as the attention given during the study and the hope of recovery from Temu Mangga extract affected the results of MoCA-Ina score.

## **6. Recommendations**

Recommended using Temu Mangga extract for reducing the risk of cognitive function decline in elderly. Psychotherapy support is highly recommended as adjunctive therapy of Temu Mangga extract in improving the quality of life of the Elderly.

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## **Footnote**

*Conflicts of Interest:* The authors have no conflicts of interest to declare

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