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# CROSSWORD PUZZLE THERAPY AS A COGNITIVE ENCHANCEMENT INTERVENTION FOR THE ELDERLY

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## ABSTRACT

The aging process experienced by the elderly causes problems in their physical, mental, and behavioral development. The physical ability of the elderly decreases with age, which causes problems with decreased cognitive function in the elderly. One of the interventions that can be done in the elderly to stop the decline in cognitive function is Crossword Puzzle Therapy (CPT) which can improve cognitive ability, improve memory, and improve comprehension. To determine the effect of Crossword Puzzle Therapy (CPT) on the cognitive function of the elderly in the Working Area of the Tanjung Unggat Health Center, Tanjungpinang City. The research method used quasy experimental design with the One Groups PretestPosttest Design approach. The sample in the study was 33 elderly people who were treated at the Tanjung Unggat Health Center in Tanjungpinang City and the sampling technique was a purposive sampling technique. This study uses a normality test with a sig. > 0.005 and continued with a non- parametric test, namely the Wilcoxon test. The results of the study are known to have a P value which shows a number of 0.000 which means that the significant value is < 0.05 value so that Crossword Puzzle Therapy (CPT) on cognitive function has a significant influence, namely H0 is rejected and Ha is accepted. There is an effect of Crossword Puzzle Therapy (CPT) on cognitive function in the working area of the Tanjungunggat Health Center in Tanjungpinang City with a P value of 0.000. it is hoped that the health center can apply Crossword Puzzle Therapy (CPT) in improving the quality of health of the elderly, especially in handling the cognitive function of the elderly.

**Keywords:** Elderly, Cognitive function, Crossword Puzzle Therapy (CPT)

## INTRODUCTION

Increased global life expectancy has changed demographic structures, leading to a significant increase in the elderly population. This phenomenon, known as population aging, brings complex health challenges, particularly related to cognitive decline [Reference 1]. Cognitive function is the brain's ability to acquire, process, store, and use information, encompassing domains such as memory, attention, language, and visuospatial abilities [Reference 2]. With age, structural and functional changes in the brain naturally increase the risk of mild cognitive impairment (MCI) and dementia [Reference 3].

Cognitive impairment in older adults is a critical issue because it is directly associated with loss of independence, increased risk of falls, and overall decline in quality of life, ultimately leading to higher healthcare costs [Reference 4]. Nationally, data from [Data Source, e.g., Basic Health Research Report/Health Office] show that the prevalence of older adults with cognitive impairment in Indonesia reaches [National or Local Prevalence Percentage], highlighting the need for effective and sustainable interventions. Specifically in

the Tanjungpinang City area, promotion and prevention efforts through community health centers (Puskesmas) are at the forefront of maintaining the health of the elderly.

In response to these challenges, non-pharmacological interventions, such as Cognitive Stimulation Therapy (CST), are widely recommended to slow the rate of cognitive decline and preserve cognitive reserve. One promising form of CST is Crossword Puzzle Therapy (CPT). CPT is a brain exercise that involves solving crossword puzzles, which is a dual cognitive task that simultaneously activates several areas of the brain. This activity intensively trains lexical and semantic memory (remembering words and their meanings), focused attention, and executive function (problem-solving strategies). Scientific support for CPT has been demonstrated through various studies. concluded that puzzle-based interventions positively correlate with improved cognitive test scores in older adults. Although the effectiveness of CPT has been proven globally, its implementation and validation of effectiveness in the specific context of public health services in the Tanjung Unggat Community Health Center Working Area still requires empirical evidence. In addition, CPT offers the advantages of low cost, ease of adaptation, and high acceptance among the elderly, making it an ideal choice for Community Health Center programs.

## MATERIAL AND METHODS

A. Research Design

This study used a Quasi-Experimental Design. The approach used is a One Group Pretest-Posttest Design, in which cognitive function measurements are taken before the intervention (pretest) and repeated after the Crossword Puzzle Therapy (CPT) intervention is completed (posttest) in the same group of subjects. This design was chosen because it allows researchers to measure changes or the effects of CPT intervention even without using a control group.

B. Population and Sample

The population in this study consisted of all elderly people (aged 60 years and above) who were registered and lived in the working area of the Tanjung Unggat Community Health Center, Tanjungpinang City. The sample in this study consisted of [Insert Sample Size, based on the text excerpt is 33] elderly people, who were selected using purposive sampling (sample selection based on specific considerations). The inclusion criteria are: Elderly aged 60 years and above. Able to read and write (to facilitate the implementation of CPT). Initial cognitive status shows decline (MMSE score between [Specify Initial MMSE Score Range, for example: 18- 26], indicating mild to moderate cognitive decline). Willing to participate in the study and sign an informed consent form.

C. Research Location and Time

This research was conducted in the working area of the Tanjung Unggat Community Health Center, Tanjungpinang City. Data collection was carried out during the [Total Research Duration, for example one month], starting from [Start Month and Year, for example February 2025] to [End Month and Year, for example March 2025].

D. Research Instrument

Independent Variable: Crossword Puzzle Therapy (CPT). The intervention tool consists of crossword puzzle books tailored to the educational level and age of the elderly, covering general vocabulary and basic knowledge. Dependent Variable: Cognitive Function. The measurement tool used is the Mini-Mental State Examination (MMSE) questionnaire, which has been validated and is used for screening cognitive function. The MMSE assesses five cognitive domains: orientation, registration, attention and calculation, memory, and language. The total score ranges from 0 to 30.

E. Intervention Protocol

This intervention uses specially designed crossword puzzles. The CPT protocol is standardized as follows: Duration: Each session lasts for enter duration, e.g., 30 minutes. Frequency: The intervention is conducted enter frequency, e.g., 3 times a week. Total Period: Therapy is conducted over a period of enter Total Weeks, e.g., 4 weeks. Procedure: Therapy is conducted in a group setting under the supervision of a researcher.

Participants are given guidance on how to complete the puzzles, and encouragement and assistance are provided to maintain engagement.

F. Data Collection

ProceduresEthical Approval: Ethical approval was obtained from Awal Bros University Health Research Ethics Committee Written Consent: Potential participants were informed about the purpose and procedures of the study, and voluntary written consent was obtained. Pretest: The MMSE is administered to all eligible participants to obtain a baseline cognitive function score. Intervention: The CPT is conducted according to the protocol described above. Posttest: Immediately after the final CPT session, the MMSE is administered again to obtain a post-intervention cognitive.

E. Data Analysis

Univariate analysis : Descriptive statistics, including frequency distribution, percentages, means, and standard deviations, were used to describe the characteristics of the sample (age, gender) and the central tendency of the cognitive scores.

Bivariate Analysis**:** The relationship between the pretest and posttest scores was analyzed to determine the effect of the intervention. Normality test: The Shapiro-Wilk Test was used to check the data distribution. Hypothesis Testing: Since the cognitive function data was non-normally distributed, the non-parametric Wilcoxon Signed-Rank Test was employed. A P value less than 0.05 ($p < 0.05$) was considered statistically significant.

## RESULTS AND DISCUSSION

A. Univariate

Analysis was used in this study to provide an overview of the characteristics of the respondents. In the working area of the Tanjung Unggat Community Health Center, Tanjungpinang City, the calculation (univariate analysis) produced data, which included the frequency distribution and percentage of cognitive function before and after receiving Crossword Puzzle Therapy (CPT), as well as the distribution of respondents by age and gender. Respondent Characteristics Based on Age.

**Tabel 4. 1 Frekuensi Responden Berdasarkan Usia di Wilayah Kerja**

| Usia Responden | Jumlah | Persentase |
|---|---|---|
| 60-64 Tahun | **12** | **36,4** |
| 65-69 Tahun | **21** | **63,6** |
| **Total** | **33** | **100** |

Based on the data in Table 4.3, there was a change in cognitive function in respondents before and after receiving Crossword Puzzle Therapy (CPT). Before treatment, the cognitive function category with the highest frequency was probable cognitive impairment (score range 17-23), experienced by 26 respondents (78.8%).After receiving Crossword Puzzle Therapy (CPT), there was an improvement, with the highest cognitive function category shifting to normal (score range 24-30), experienced by 28 respondents (84.8%).

| Kategori Fungsi Kognitif | *Pre Test* | | *Post Test* | |
|---|---|---|---|---|
| | Frekuensi (f) | Persentase (%) | Frekuensi (f) | Persentase (%) |
| Normal (24-30) | **0** | **0** | **28** | **84,8** |
| *Probable*/kemungkinan gangguan kognitif (17-23) | **26** | **78,8** | **2** | **6,1** |
| *Definitif*/sudah pasti terjadi gangguan kognitif (0-16) | **7** | **21,2** | **3** | **9,1** |
| **Total** | **33** | **100** | **33** | **100** |

B. Analisa Bivariat

The Wilcoxon Signed-Rank Test ($N=33$) confirmed a highly significant difference between pretest and posttest cognitive scores. The analysis showed no decline (*Negative Ranks = 0*) and no change (*Ties = 0*); conversely, all respondents exhibited score improvement (*Positive Ranks*). This conclusively demonstrates that Crossword Puzzle Therapy (CPT) has a significant positive effect on the cognitive function of the elderly in the UPTD Tanjung Unggat Public Health Center area.

| | | N | Mean Rank | Sum of Ranks | P Value |
|---|---|---|---|---|---|
| *Posttest – Pretest* | *Negative Ranks* | 0 | 0,00 | 0,00 | 0,000 |
| | *Positive Rank* | 33 | 17.00 | 561.00 | |
| | *Ties* | 0 | | | |
| | *Total* | 33 | | | |

C. Interpretation and Discussion of Results

a. The research clearly established a significant effect of Crossword Puzzle Therapy (CPT) on enhancing the cognitive function of the elderly. The Wilcoxon Signed-Rank Test yielded a value of 0.000 ($P < 0.05$), leading to the rejection of the null hypothesis (H0). This confirmed the alternative hypothesis (Ha), proving that CPT has a statistically significant influence on cognitive scores.

b. Mechanism of CPT and Alignment with Theory
The efficacy of CPT is explained by its function as a Cognitive Stimulation Therapy (CST), which actively utilizes and strengthens neural pathways. CPT challenges the brain by demanding simultaneous engagement of key cognitive domains. lexical and semantic memory solving crosswords requires effortful retrieval of vocabulary and word meanings, which strengthens memory access and linguistic fluency. Executive function the activity necessitates sustained attention, concentration, and problem-solving, thereby stimulating the frontal lobe functions responsible for higher-order thinking.

## CONCLUSION

Based on the research findings and the comprehensive discussion regarding the influence of Crossword Puzzle Therapy (CPT) on the cognitive function of the elderly within the operational area of the Tanjung Unggat Public Health Center in Tanjungpinang City, the following conclusions have been systematically drawn. The descriptive analysis of the cognitive scores revealed a clear positive shift in the participants' condition. Prior to the CPT intervention, the majority of the elderly population studied were classified under the Probable Cognitive Impairment category. Following the structured administration of CPT, their cognitive function scores showed a significant increase, resulting in the majority of respondents being categorized as having Normal Cognitive Function. The statistical evidence further validated the intervention's effectiveness. The Wilcoxon Signed-Rank Test yielded a $P$ value of 0.000. Given that this value is significantly less than the established alpha level (alpha = 0.05), the research established a statistically significant difference between the pretest and posttest scores. Consequently, the Null Hypothesis (H0) is definitively rejected, and the Alternative Hypothesis (Ha) is accepted. This confirms the core finding: Crossword Puzzle Therapy (CPT) has a significant positive influence on improving the cognitive function of the elderly in the study area.

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