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The effect of health media in reminiscence therapy on cognitive disorders in post-stroke patients

El efecto de los medios sanitarios en la terapia de reminiscencia sobre los trastornos cognitivos en pacientes que han sufrido un accidente cerebrovascular

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SUMMARY

Introduction: *One of the psychosocial obstacles that often arise in post-stroke patients is cognitive obstacles. These obstacles include various problems in cognitive function, ranging from disturbed attention and difficulty in maintaining orientation to time, place, or situation to problems in memory and thought processes. This study aims to investigate the effect of health media in reminiscence therapy on cognitive disorders in post-stroke patients in Medan City.* **Methods:** *This research uses quantitative research methods. Data was collected by distributing questionnaires to respondents in seven hospitals in Medan City.* **Results:** *Analysis of respondents' characteristics shows the dominance of the age group over 45, with the majority having a Diploma/S1 education level. The reliability and validity of the variables, particularly the influence of health media in reminiscence therapy, demonstrate a high level of reliability and validity, instilling confidence in the research's methodology.* **Conclusions***: Provide valuable guidance for the development of more effective interventions in the management of post-stroke patients.*

Keywords: *cognitive disorders, health media, post-stroke patients, reminiscence Therapy*

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RESUMEN

Introducción: *Uno de los obstáculos psicosociales que a menudo surgen en pacientes que han sufrido un ictus son los obstáculos cognitivos. Estos obstáculos incluyen diversos problemas en la función cognitiva, como la atención alterada, la dificultad para mantener la orientación en el tiempo, el lugar o la situación, hasta problemas en la memoria y los procesos de pensamiento. Este estudio tiene como objetivo investigar el efecto de los medios de comunicación de salud en la terapia de reminiscencia sobre los trastornos cognitivos en pacientes que han sufrido un ictus en la ciudad de Medan.* **Métodos:** *Esta investigación utiliza métodos de investigación cuantitativos. Los datos se recopilaron distribuyendo cuestionarios a los encuestados en*

siete hospitales de la ciudad de Medan. **Resultados:** *Los resultados de la investigación muestran que el análisis de las características de los encuestados muestra el predominio del grupo de edad de más de 45 años, y la mayoría tiene un nivel de educación de Diploma/S1. Los resultados de la fiabilidad y validez de las variables muestran variabilidad en el nivel de fiabilidad, destacando la influencia de los medios de comunicación de salud en la terapia de reminiscencia como una variable que tiene una buena fiabilidad y validez*. **Conclusiones:** *Proporcionar una valiosa orientación para el desarrollo de intervenciones más eficaces en el tratamiento de pacientes que han sufrido un ictus*.

Palabras clave: *Medios de salud, terapia de reminiscencia, trastornos cognitivos, pacientes post-ictus*.

INTRODUCTION

Stroke is a major global health problem involving both physical and psychosocial health. Psychosocial well-being is frequently threatened following stroke. Depressive symptoms, anxiety, general psychological distress, cognitive impai-rement and social isolation are prevalent (1).These include various problems in mental function, such as distracted attention and difficulty in maintaining orientation to time, place, or situation, ranging from problems in memory and thought processes (2). Patients often struggle to focus on certain tasks, remember new information, or make everyday decisions (3). Apart from cognitive impairment, stroke can also cause various physical disabilities. Limited movement, paralysis, or weakness in the limbs often occurs because of brain damage during stroke (1). Sensory problems can also occur, including cognitive and psychological disorders such as anxiety and even depression. This condition can significantly disrupt a patient's quality of life, affecting their ability to function independently, interact socially, and experience happiness in everyday life (4).

Stroke is the number one cause of disability and the second cause of death worldwide after heart disease. In Indonesia, stroke is also the leading cause of death. According to the 2018 Indonesia Basic Health Research (Riskesdas) results, the prevalence of stroke in Indonesia increased from 7 per 1000 population in 2013 to 10.9 per 1 000 population in 2018 (5). This shows that stroke is an increasingly worrying health problem in Indonesia (6). In terms of financing, stroke is also one of the catastrophic diseases, with the third largest funding after heart disease and cancer, reaching 3.23 trillion rupiahs in 2022. This number has increased significantly compared to the previous year, namely 1.91 trillion in 2021. These data show that the economic burden caused by stroke is also growing from year to year, emphasizing the importance of stroke prevention, management, and rehabilitation efforts in Indonesia (7).

Even though stroke is the second leading cause of disability and death in the world after heart disease, an interesting fact is that around 90 % of stroke cases can be prevented by controlling certain risk factors. These factors include hypertension, smoking, unbalanced diet, lack of physical activity, diabetes, and atrial fibrillation (8). Data from Riskesdas in 2018 highlights that the prevalence of hypertension reached 8.4 % in the population aged over 18 years, and the prevalence of diabetes was 10.9 % in the population aged over 15 years. As many as 95.5 % of the population had a fruit and vegetable consumption pattern that did not comply with health standards, especially in the age group over five years (9). These figures emphasize that controlling stroke risk factors is still a major challenge in efforts to prevent and control stroke in Indonesia (10). More serious efforts are needed to increase public awareness of the importance of a healthy lifestyle, routine health monitoring, and appropriate interventions to reduce the prevalence of risk factors associated with stroke (11). This emphasizes the important role of the health system and public health education in changing behavior and lifestyle that can treat post-stroke by using health media such as reminiscence in treating post-stroke patients in the future (12).

Health media in reminiscence therapy can be an effective tool in helping emotional control in post-stroke patients. According to Chiang et al., 2010 (13), reminiscence therapy has several broad and significant goals (14). One is providing a pleasant experience to improve the patient's quality of life. By recalling cherished moments from the past, this therapy offers joy

and emotional satisfaction and helps patients find meaning in their life experiences (15). Apart from that, reminiscence therapy also aims to improve socialization and relationships with other people. By discussing shared memories, patients can strengthen bonds with their family, friends, and caregivers, increasing social support and psychological well-being (16). This therapy also provides important cognitive stimulation, as it requires processing information and memories of past events (17). By stimulating cognitive functions such as memory, attention, and problem-solving, reminiscence therapy can help maintain or improve a patient's mental abilities (18). This therapy also enhances verbal and non-verbal communication between patients, nurses, families, and fellow patients. Better communication can help patients communicate their needs, feel heard, and strengthen interpersonal relationships (19).

The media used in reminiscence therapy activities are objects related to the patient's past (20). One media often used is a reminiscence kit, a box filled with various items relevant to the patient's past (21). These items can include personal photos and devices for playing music and videos. Apart from that, sensory stimulation is also included in this kit, such as different smells such as chocolate or orange, as well as materials to stimulate tactile sensors such as animal fur, wool and flannel, sand, mud, and so on (22). These past objects have an important role in reminiscence therapy because they help patient recall past experiences related to these objects (23). When patients interact with these objects, it can trigger related memories and speed up their memory process. This media can also help patients share past experiences with others, be they therapists, family or friends (24). Through this process, the goals of reminiscence therapy to improve quality of life and strengthen connections with the past can be achieved more effectively (25). Thus, using relevant and varied media in reminiscence therapy provides a valuable contribution to facilitating the recovery process and improving the patient's emotional well-being after a stroke (26).

Therefore, reminiscence therapy is a reflective experience about the past and a holistic therapeutic intervention with significant benefits for the patient. Health media can also stimulate social interaction and communication between patients and those closest to them, such as family and friends (27). Discussion of photos or shared memories can strengthen interpersonal relationships and build social support, which is important in post-stroke recovery (28). Thus, using health media in reminiscence therapy helps improve the emotional well-being of post-stroke patients, strengthens social bonds, and promotes holistic recovery (29). The importance of using health media in this therapy emphasizes the need for an integrated multidisciplinary approach to caring for post-stroke patients, considering their physical, psychological, and social conditions (30).

Several studies have discussed the effect of health media in reminiscence therapy on cognitive disorders in post-stroke patients. Previous research by Abtaru et al., 2024 discussed the impact of memory therapy on cognitive ability in non-hemorrhagic stroke patients at Empa Lawang Regency Hospital (31). The results of the study showed that cognitive ability in non-hemorrhagic stroke patients before being given memory therapy was 20.10. The cognitive ability of non-hemorrhagic stroke patients after being given memory therapy was 26.60, and there was an effect of memory therapy on cognitive ability in non-hemorrhagic stroke patients at the Empat Lawang Regency Hospital ($p = 0.0001 < \alpha$). Hospitals can utilize this study as an alternative solution for the treatment of non-hemorrhagic stroke patients with impaired cognitive function at the Empat Lawang Regency Hospital (32), as well as the research conducted by Cheng et al. (33) who assessed the benefit of a reminiscence therapy-based care (RTBC) program on cognitive impairment restoration, anxiety, and depression reduction in acute ischemic stroke patients showing that reminiscence therapy-based care could help reduce cognitive impairment, anxiety, and depression in post-stroke management for acute ischemic stroke patients.

The present study focused on studying the effect of health media in reminiscence therapy on cognitive disorders in post-stroke patients. The aim was to evaluate the influence of health media on memory therapy and cognitive control in post-stroke patients. Then the latest research explained by the researcher is the effect of health media memory therapy on emotional

control in post-stroke patients using the Health Reminiscence Kit. The memorabilia is filled with various items from the past, such as magazines, cooking utensils, clothes, playground equipment, personal photos, tools for playing music, videos, and tapes, as well as different odor stimuli, such as chocolate, orange, etc. Materials for stimulating tactile sensors include animal fur, wool, flannel, sand, and mud.

METHODS

Data Collection

This study uses a primary data model obtained from questionnaires distributed to respondents. The questionnaire is a data collection technique that applies a series of written questions to respondents to be answered. The questionnaire was created using a Google Form. The researcher distributed a questionnaire to respondents in seven hospitals in Medan City. A brief explanation of the format and types of questions used on Google Forms can add to an understanding of how data are collected. The format used in this questionnaire includes closed-ended questions with a Likert scale, multiple choice, and open-ended questions. Using these questions allows researchers to collect quantitative and qualitative data effectively.

Before the questionnaire was distributed, validity and reliability tests were carried out to ensure that the measuring tools used were valid and consistent. Validity is tested through factor analysis and construct validity, while reliability is tested using Cronbach's alpha. This questionnaire has been tested previously in a preliminary study to ensure its reliability and suitability in the context of this study. In addition, specific criteria were used to ensure proper representation in the selection of hospitals. These include hospital categories based on type, geographic location, and number of patients. The choice of these hospitals affects the generalization of the research results, where the results are more relevant for hospitals with similar characteristics. This needs to be considered when drawing broader conclusions from the results of this study.

Sampling Technique

The sample was determined using an area or cluster sampling technique, which randomizes the group, not the individual subjects, including exclusion criteria applied to selecting hospitals and respondents. The inclusion criteria include hospitals with specific facilities and the number of patients according to the characteristics of the study. In contrast, the exclusion criteria include hospitals that do not meet these minimum standards. Similarly, respondents were selected based on inclusion criteria such as age, gender, and specific health conditions, while exclusion criteria were applied to respondents who did not meet those criteria (34). Area or cluster sampling techniques are used to determine samples if the object to be studied or data source is very broad, such as the population of a country, province, or district. Samples were taken based on predetermined population areas to determine which population would be used as a data source. Seven hospitals were taken as samples in Medan City. Seven hospitals were chosen as research samples purposively and close to each other.

Measurement and Analysis Techniques

Data management used SEMpls software to test the correlation between the research variables and prove the researcher's hypothesis regarding the influence of health media in reminiscence therapy on cognitive control in post-stroke patients. Regression tests were carried out to obtain valid data on the questionnaire score indicators, using the Likert scale approach (1. Strongly disagree, 2. Disagree, 3. Neutral, 4. Agree, and 5. Strongly agree).

This structural equation modeling (SEM) model was set to analyze the relationship between variables. SEM evaluates the relationship structure between hypothetical independent and dependent variables. SEM allows researchers to test complex models involving many latent variables and causal relationships between them, simultaneously considering the measurement of error and construct validity. This SEM model is perfect for testing complex hypotheses and

providing a deeper understanding of the variable dynamics in this study.

RESULTS

Table 1. Respondent data on the influence of health media in reminiscence therapy on cognitive control in post-stroke patients

Characteristic	Freq	%
Age		
17-25 years	1	1.7
26-35 years	9	15.3
36-45 years	33	3.4
>45 years	57	79.7
Gender		
Man	57	54.3
Woman	43	45.7
Last education		
elementary school	10	9.5
Junior High School	16	15.2
Senior High School	19	18.3
Bachelor	54	51.4
Master	6	5.6

Based on data from researchers distributing questionnaires to respondents in seven hospitals in Medan City, several significant findings reflect variations in age, gender, and highest level of education. As shown in Table 1, the age of the Medan City population shows dominance in the age group over 45 years, with 79.7 % of the total population, while only a small portion is in the 17-45-year age range. Regarding gender, the population distribution tends to be balanced, although there are slightly more men, with a percentage of 54.3 %, compared to women, who reach 45.7 %. Looking at the latest education level, most of the population has a Diploma/S1 education level, reaching 51.4 %. However, there is also significant representation from other levels of education, such as SMA/SMK (18.3 %), SMP/MTS (15.2%), and SD (9.5 %). The highest level of education, namely a master's degree, has a lower number with a percentage of 5.6 %. Researchers distributed questionnaires to respondents in seven hospitals located in Medan City with the hope of obtaining fairly representative and varied data for further analysis regarding the characteristics of the population in the area.

Research Variable Reliability

Table 2. Composite reliability and Cronbach's alpha inspection results reminiscence therapy for cognitive control in post-stroke patients

Variable	Cronbach's Alpha	Rho_A	Composite Reliability	Average Variance Extracted (AVE)
Photos from the past	0.325	0.547	0.614	0.378
Music player device	0.128	0.173	0.668	0.527
Fragrance sensory stimulation	1.000	1.000	1.000	1.000
Touch sensory stimulation	0.513	-1.386	0.803	0.671
Media Influence Health in	0.513	0.523	1.000	1.000

The results of the variable construction analysis in this study show several indicators relevant to reminiscence therapy in post-stroke patients (Table 2). Using photos in the past has Cronbach's alpha value of 0.325, indicating a low reliability. Meanwhile, music-playing devices have an even lower Cronbach's alpha value, namely 0.128, indicating that the reliability of this variable needs further attention. On the other hand, fragrance sensory stimulation had perfect Cronbach's alpha and Rho A values (1.000), indicating a very high level of consistency in

measuring these variables. However, it should be noted that several indicators show negative Rho A values, such as touch sensory stimulation. This suggests problems in inter-item reliability, which could indicate that this variable may not be suitable for measuring a particular construct.

On the other hand, the effect of health media in reminiscence therapy on cognitive control in post-stroke patients shows satisfactory values in all aspects, with Cronbach's alpha, Rho_A, composite reliability, and average variance extracted (AVE) values reaching 1.000. Overall, the results of this analysis provide valuable insight regarding the reliability and validity of the variables involved in reminiscence therapy in post-stroke patients. Further efforts are needed to improve the unsatisfactory reliability of indicators and ensure the use of appropriate variables in measuring the construct in question.

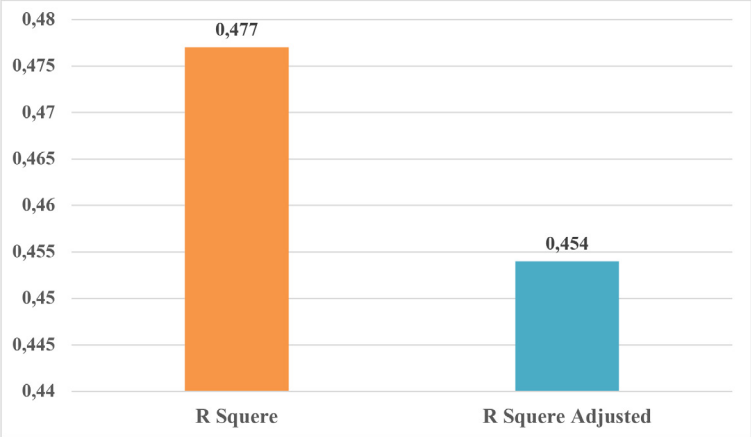

Figure 1. Regression results on the influence of health media in reminiscence therapy on cognitive control in post-stroke patients.

The analysis results show that the model used to measure the influence of health media in reminiscence therapy on cognitive control in post-stroke patients can explain the variability in this phenomenon. As shown in Figure 1, R square, a measure of model strength, shows that the variables included in the model explain approximately 47.7 % of the variation in the influence of health media in reminiscence therapy on cognitive control in post-stroke patients. Next, adjusted R square is a measure that considers the number of independent variables in the model. The adjusted R square value of 45.4 % shows that this model maintains a good power level in explaining variability, even after considering the number of independent variables used.

Hypothesis testing was carried out between independent and dependent variables using the bootstrapping method in SEMPLS to determine the validity and reliability of the research data. This test uses T-statistics and P-values, which will later be presented as a t-table, to find valid research data for T- T-statistic values> 1.96 and P-values < 0.05.

Based on the results in Table 3, it can be concluded that the observed variables have undergone a t-statistical test (T-statistics) to determine the significance between the sample and the population average. Photos from the past test results show that the sample average (M) is 0.251 with a standard deviation (STDEV) of 0.083. The resulting T-statistics are 2.762, with a p-value of 0.006. Because the p-value is less than the specified significance level, namely 0.05, the hypothesis is accepted, indicating statistical significance between the variable "Photos from the past" and the observed population. The music player device variable's sample mean (M)

Table 3. T-statistical test (T-statistics) to determine the significance between the sample and the population average

Variable	Original Sample (O)	Sample Mean (M)	STDEV	T-Statistics (|O/STDEV|)	P value	Hypothesis
Photos from the past	0.230	0.251	0.083	2.762	0.006	Accepted
Music player device	0.218	0.180	0.111	1.975	0.049	Accepted
Fragrance sensory stimulation	0.229	0.207	0.078	2.920	0.004	Accepted
Touch sensory	0.532	0.483	0.187	2.849	0.005	Accepted

is 0.180, with a standard deviation (STDEV) of 0.111. The resulting T-statistics were 1.975, with a p-value of 0.049. Since the p-value is less than the established significance level, the hypothesis is also accepted for this variable, indicating the presence of statistical significance. The sample mean (M) for fragrance sensory stimulation was 0.207, with a standard deviation (STDEV) of 0.078. The T-statistics is 2.920 with a p-value of 0.004. As before, the hypothesis is accepted because the p-value is smaller than the specified significance level. This variable's sample mean (M) for touch sensory stimulation was 0.483, with a standard deviation (STDEV) of 0.187. The resulting T-statistics was 2.849, with a p-value of 0.005. Again, the hypothesis is accepted because the p-value is less than the specified significance level. Thus, all observed variables show statistical significance, indicating a significant relationship between these variables and the observed population.

DISCUSSION

The study emphasized that using past photos as a memory therapy medium can significantly impact cognitive recovery in post-stroke patients. A p-value<0.05 indicates a real relationship between applying past photos and improving patients' cognitive function. This is in line with the theory of nostalgia-based therapy by Haslam et al., 2008, where using past photos helps restore cognitive impairment while improving the patient's confidence and emotional well-being (35). Theoretically, photos from the past can re-stimulate long-term memory by activating brain areas related to visual and emotional processing. This is supported by Gibson et al. 2022, who state that familiar visual media such as family photos can trigger improvements in spatial orientation and working memory in post-stroke patients (36). Therefore, a visual-based approach utilizing photo media improves cognitive function, especially in patients with stroke disorders. In addition, these findings reinforce the relevance of nostalgia-based therapy in cognitive care programs in various health services, especially in rehabilitation centers. A deeper understanding of how visual memory works in stimulating brain recovery could provide new insights for medical practitioners to develop more personalized interventions based on patients' emotional needs.

Furthermore, the music player device variable also significantly influenced the results of memory therapy or cognitive function. These findings support the hypothesis that using music player devices is closely related to improved cognitive function in patients, especially post-stroke patients. Sarkamo et al. 2008, have also shown that music therapy can have a positive impact on cognitive function, particularly on aspects of verbal memory and attention (37). This confirms that listening to music through a player allows patients continuous and personalized stimulation. Furthermore, de Witte et al. (2020) emphasize that music can facilitate neuroplasticity in the brain, which plays an important role in recovery from stroke damage (38). Music serves as a

stimulus and promotes synaptic regeneration that supports cognitive improvement. In this case, music player devices play an important role as they allow patients to select music according to their preferences, thus providing better comfort and accessibility. From the author's point of view, these results reinforce the idea that music can serve as an effective therapeutic medium in cognitive care. Music can influence emotions and cognition and can be a multifunctional tool—both as entertainment and therapy. Music player devices allow patients to engage in therapy more independently and personally, indirectly encouraging their commitment to the therapy program.

In the sensory stimulation section, the use of fragrance has a significant influence on cognitive recovery. These results indicate that the hypothesis is accepted, thus confirming a significant relationship between sensory stimulation through scent and cognitive enhancement in patients. These findings align with Moss et al. (2003), who showed that certain scents, such as rosemary and lavender, can stimulate cognitive function, including improved memory and attention (39). In therapy for post-stroke patients, pleasant and familiar scents have been shown to help calm patients and stimulate parts of the brain related to memory and sensory processing. It emphasizes that sensory stimulation through fragrances, when applied consistently in therapy, can support the cognitive recovery of patients with brain disorders, such as stroke. From the authors' point of view, these results reinforce the argument that a holistic approach to treating patients with cognitive impairment should include sensory elements. As part of therapy, certain fragrances provide an emotionally calming experience and stimulate areas of the brain that are important for cognitive recovery. Therefore, healthcare practitioners must consider using fragrances as part of a holistic therapeutic approach.

Our results show that sensory stimulation through touch significantly influenced cognitive recovery in post-stroke patients. The hypothesis was accepted with a p-value <0.05, indicating a significant association between touch therapy and improved cognitive function. These results are in line with Field et al. (2004), showing that tactile stimulation through therapeutic massage can enhance cognitive function and mood, especially in individuals with depression or neurological disorders (40). These findings are relevant for post-stroke patients who often experience mood decline and cognitive impairment. Therapeutic touch provides emotional support and stimulates the brain's parts related to memory and sensory processing. From the authors' point of view, these results reinforce the importance of a holistic approach in cognitive recovery therapy by paying special attention to sensory aspects that are often overlooked. Touch as a form of tactile sensory stimulation can be a simple but effective intervention in improving the quality of life of post-stroke patients. This shows that touch therapy is not only related to the physical aspect but also has an important emotional dimension in recovery.

CONCLUSION

This study concluded that memory therapy has significant potential to improve cognitive control in post-stroke patients, especially among the residents of Medan City, which is dominated by the age group above 45 years with a balanced gender distribution and varying levels of education. Although the health media in this therapy shows good reliability, variables such as past photos and music player devices still need improvement through the development of standard guidelines and training for health workers. It is recommended that therapy materials be tailored to the patient's level of understanding and the specific needs of age groups over 45 years and integrated with other effective therapeutic approaches. Further research is needed to evaluate the long-term effects of memory therapy and improve the missing aspects. Implementing this recommendation is expected to increase the effectiveness of memory therapy interventions in the cognitive recovery of post-stroke patients.

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