

***Guideline Development of Healthy Brain and Mind Application for
Enhancing Cognitive Functions of Adults***

Juthamas Haenjohn, Burapha University, Thailand
Warakorn Supwirapakorn, Burapha University, Thailand
Ketsara Noimanop, Burapha University, Thailand
Tanida Julvanichpong, Burapha University, Thailand

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Abstract

The purposes of this research were 1) to study healthy brain and mind application (HBM app.) that can enhancing cognitive functions of adult, 2) to study the adults' satisfaction and opinion on HBM app. to develop cognitive functions and being healthy adults. The informants were 20 adults' experimental group who willing to participate in this research project. The data was collected through the satisfaction questionnaire and semi-structured interviews and analyzed by content analysis. The research results revealed that;

1. The HBM application composes 3 parts: Part 1: the general information and defining valued, goals and committed actions ways for being healthy adults based on Acceptance and Commitment Therapy (ACT). Part2: brain health training via 4 activities and mental health training via 3 activities Part3: daily records of healthy lifestyles for 1) physical health via eat good nutrition, sleep well and 30 minutes exercise 2) relationships activities of each day and 3) daily money plaining and expense.
2. The adult's opinion on the HBM applications. The thought that the HBM application could help them for enhancing cognitive function and mental health, including the guideline for taking the committed actions in line with the life values of being healthy adult and being healthy aging after retirement.

Keywords: Healthy Brain and Mind Application, Adults, Acceptance and Commitment Therapy

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Introduction

The concept of "Healthy Ageing" has replaced the WHO's previous term, "Active Aging," which encompassed three characteristics of older adults: good health, participation, and security (WHO, 2002). The Active Aging Index for Thai elderly individuals consists of four dimensions: health, participation, security, and an enabling environment (National Statistical Office, 2017). Healthy Ageing refers to the process of developing and maintaining functional ability, which contributes to well-being across the life course. Functional ability is the capability to perform various functions, including: 1) meeting basic needs, 2) learning, growing, and making decisions, 3) being mobile, 4) building and maintaining relationships, and 5) contributing to society (WHO, 2018). In Thailand, Healthy Ageing is defined as the state of being an elderly person free from disease, with the ability to engage physical, physiological, mental, and social capacities that change due to the aging process, enabling them to function appropriately. This refers to elderly individuals who have the potential to lead a normal life and contribute to their community and society (Ministry of Public Health, 2018). The assessment of Healthy Ageing in Thailand encompasses: 1) limitations and disabilities in performing basic daily activities, 2) a comprehensive assessment of resources, including common problems and diseases among the elderly (e.g., diabetes, hypertension, cardiovascular disease risk, oral health, vision health), geriatric syndromes (cognitive impairment, depression, knee osteoarthritis, falls, urinary incontinence, nutritional problems, sleep disorders), and functional capacities for self-care, 3) cognitive and functional capacities, and 4) diseases and complaints that impact and burden the elderly. Developing a new generation of robust and self-reliant elderly individuals who are prepared to care for themselves physically, mentally, and socioeconomically is therefore crucial.

Haenjohn et al., (2022) indicated that the local folk handicraft experts, particularly those skilled in traditional weaving, serve as excellent role models for active ageing in the Eastern Economic Corridor (EEC) region. As transmitters of valuable cultural and social knowledge in traditional handicrafts, these elderly experts take pride in their work and experience moderate to high levels of mental well-being and happiness indicators. Research results shown that the local folk handicraft ageing: 1) robust physical health, 2) High cognitive functions due to the focused attention and memory required for weaving intricate patterns, 3) happiness, positive emotions, mental agility, stress relief, and social engagement through group weaving activities, and 4) the ability to earn income and support themselves and their families (Haenjohn, et al., 2022).

The process of developing and maintaining the functional ability that enables wellbeing in older age.” Functional ability is about having the capabilities that enable all people to be and do what they have reason to value. Functional ability is about having the capabilities that enable all people to be and do what they have reason to value. Functional ability is the capability to perform various functions, including: 1) meeting basic needs, 2) learning, growing, and making decisions, 3) being mobile, 4) building and maintaining relationships, 5) contributing to society (World Health Organization: WHO, 2020; Chalfont et al., 2022).

The purposes of this research were 1) to study healthy brain and mind application (HBM app.) that can enhancing cognitive functions of adult, 2) to study the adults’ satisfaction and opinion on HBM app. to develop cognitive functions and being healthy adults.

The research results revealed that;

1) The Healthy Brain and Mind Application (HBM) is developed for enhancing cognitive functions of adults in EEC based on the integrating research findings across all stages with psychological principles; Acceptance and Commitment Therapy (ACT), Dialectical Behavior Therapy (DBT), Neuro-Linguistic Programming (NLP), and the World Health Organization's Healthy Ageing Concept (WHO,2020). The Healthy Adult Program for the working adults in the Eastern Economic Corridor Zone aims to promote physical health, brain health, mental health, social participation, and financial security to prepare for healthy aging. It comprises learning activities and skill practice across 5 modules: Module 1: Healthy Aging, Module 2: Brain Health, Module 3: Mental Health, Module 4: Relationships and Participation and Module 5: Wealth and Security. Thus, the program consists of 5 practical training sessions to instill values, goals, and practices for well-being in adulthood that lead to healthy aging. Participants then apply these practices to their daily lives for 10 days using the researcher-developed Healthy Brain and Mind (HBM) application, spending 30-50 minutes per day for a total of 15 hours.

2) The program was evaluated by 5 experts in psychology, psychiatry, neuroscience, and gerontology, who found it highly appropriate (Mean = 4, S.D.=0) in terms of objectives, key concepts, materials, duration, activities, evaluation, content, difficulty level, and real-world application (see Figure: 1).

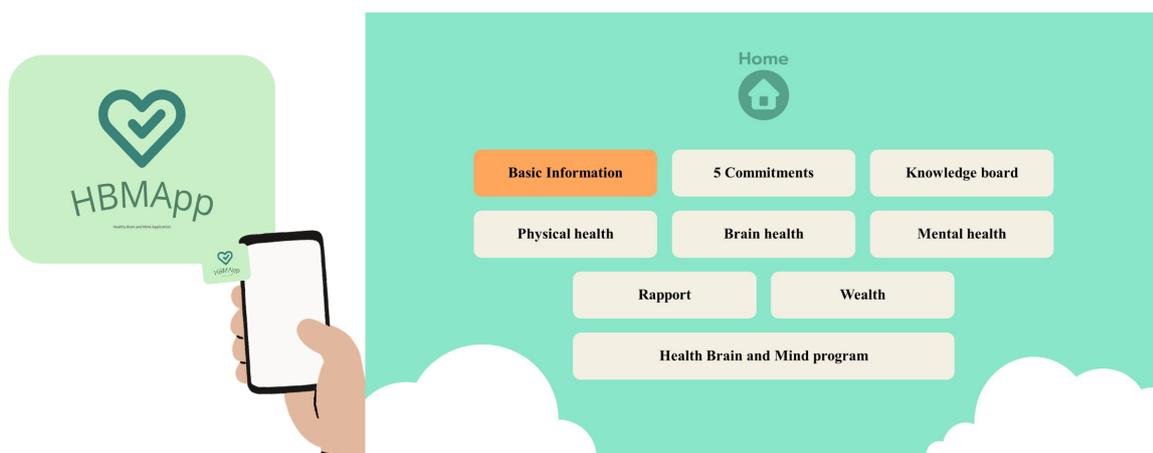


Figure 1: 5 practical training sessions of the HBM application.

Details of the Healthy Adult Program:

1. 5 commitments for healthy ageing: Activities to create values, goals, and define a lifestyle focused on well-being in adulthood.
2. Brain Health: Activities to develop a lifestyle that enhances brain health through various brain stimulation exercises:
 - a) Being Present: Choosing between breathing exercises (4,7,8 technique with increasing repetitions from 6 to 30 times) or body scans guided by audio.
 - b) Brain Plasticity: Three activities to increase brain flexibility:
 - i. Sound Awareness: Listening to bell sounds in 3 rounds and correctly identifying the number of rings (varying in each round).

- ii. Cognitive flexibility: Different activities each day, such as naming words starting with specific letters, fruits, animals, red flowers, etc., within 1 minute.
 - iii. Working memory training: Watching an animation demonstrating a weaving pattern, memorizing the pattern using pegs from level 1 (4 lines) to level 7 (12 lines).
 - c) Reporting new lifestyle patterns in diet, exercise, and sleep to enhance brain health via the HBM application.
- 3. Mental Health: Learning about the meaning and principles of life crises, creative problem-solving, psychological flexibility, and commitment strategies based on ACT principles:
 - a) Reporting daily emotional awareness and coping strategies via the HBM application.
 - b) Practicing self-as-context and cognitive defusion skills through "Let it on Cloud Floating" and "Let it on Leaves in Stream" animations with guided audio.
- 4. Relationships and Participation: Learning about building and maintaining relationships, social participation, and commitment strategies. Reporting participation choices via the HBM application 10 times.
- 5. Wealth and Security: Learning about financial planning principles, tax strategies, and strategies for a prosperous retirement. Reporting implementation via the HBM application 10 times.

Conclusion

After the program, the HBM application was used with 20 working adults in the Eastern Economic Corridor Zone by 6 practical training sessions (50 minutes each) over 1 day to establish values, goals, and practices for a well-being lifestyle aligned with short-term goals (10 days). It emphasizes brain health and mental health skill practice while reporting lifestyle changes in diet, exercise, relationships, and income/ expenses on the HBM application for 30-50 minutes per day over 10 days.

Their satisfaction with the HBM application is summarized below:

1. General Information of number and percentage of participants by gender and training device shows that out of the 20 participants, most were female (70%), and the most commonly used training device was a laptop (55%), followed by Android and iOS smartphones.
2. Satisfaction With the Healthy Brain and Mind Application (HBM)
 - 2.1 Item-Wise Satisfaction With the HBM Application

Items	M	S.D.	Satisfaction level
1.1 Identifying values, goals, and practices for being a healthy adult	4.60	0.598	Most satisfying
2.1 Proper breathing technique (4,7,8)	4.65	0.587	Most satisfying
2.6 The HBM app helps promote brain health	4.55	0.605	Most satisfying
3.2 Identifying emotion management strategies and outcomes	4.55	0.686	Most satisfying

Items	M	S.D.	Satisfaction level
3.4 Recognizing change through "Let it on Cloud Floating"	4.55	0.605	Most satisfying
6.1 Consuming brain-boosting and disease-preventing foods	4.60	0.503	Most satisfying
7. Satisfaction with the 5-hour practical training for the Healthy Adults program	4.65	0.489	Most satisfying
9. Overall satisfaction with the Healthy Adults program	4.55	0.510	Most satisfying

Table 1: Mean and Standard Deviation of Satisfaction Scores for the HBM Application by Item

The table 1 reveals that most items had a high level of satisfaction, with 8 items rated as "highest" satisfaction: (Item 1.1) Identifying values, goals, and practices for being a healthy adult (Item 2.1) Proper breathing technique (4,7,8) (Item 2.6) The HBM app helps promote brain health (Item 3.2) Identifying emotion management strategies and outcomes (Item 3.4) Recognizing change through "Let it on Cloud Floating" (Item 6.1) Consuming brain-boosting and disease-preventing foods (Item 7) Satisfaction with the 5-hour practical training for the Healthy Adults program (Item 9) Overall satisfaction with the Healthy Adults program.

2.2 Satisfaction With the HBM Application by Dimension

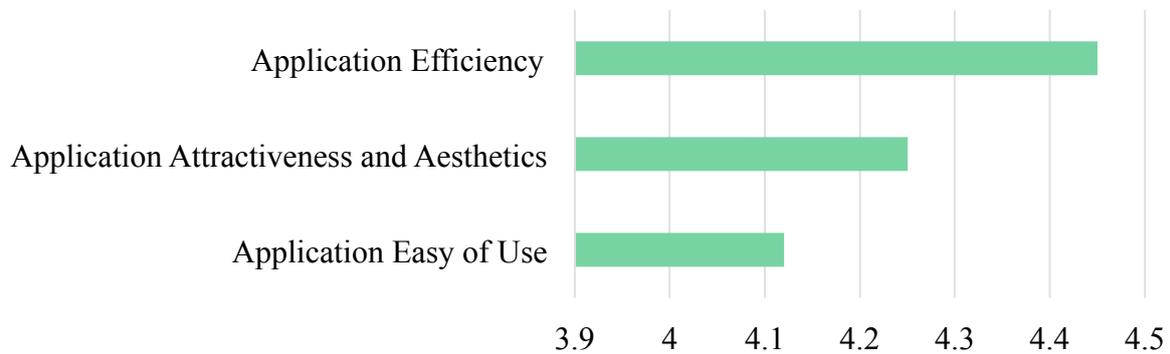


Figure 2: Satisfaction with the HBM Application by Dimension

The Figure 2 shows that the mean satisfaction level was high across all three dimensions, with the highest being "Application Efficiency" (M=4.45, S.D.=0.429), followed by "Application Attractiveness and Aesthetics" (M=4.25, S.D.=0.764), and "Application Ease of Use" (M=4.12, S.D.=0.631).

2.3 Comparison of Mean Satisfaction With the HBM Application by Gender and Training Device

Satisfaction	Gender			Type of device			
	Female	Male	t-test	IOS	Android	Laptop	F-test
Application Easy of Use	4.05	4.29	-.765 (p=.454)	4.00	4.33	4.04	.446 (p=.648)
Application Attractiveness and Aesthetics	4.26	4.22	.104 (p=.919)	4.22	4.39	4.19	.132 (p=.877)
Application Efficiency	4.43	4.49	-.300 (p=.768)	4.46	4.36	4.49	.163 (p=.851)

Table 3: Analysis Results Comparing Mean Satisfaction with the HBM Application by Gender and Training Device

The table 3 indicates that there were no significant differences in satisfaction with the HBM application between males and females or among participants using different training devices.

Strengths and Suggestions from Participants Regarding the HBM Application Training:

Strengths:

1. It was an excellent experience to have the opportunity to participate in this activity.
2. This application helped facilitate positive lifestyle changes.
3. This was an excellent training program.

Suggestions for Improvement:

1. The application should be optimized for all systems, and answer entry should be straighter forward.
2. The dietary details should be adjusted.
3. Initially, there were some issues with accessing the application, especially on mobile devices.
4. Opportunities for building relationships among participants should be provided.
5. The application should be more modern and incorporate games to enhance motivation.
6. Communication, font size, user-friendliness, and security could be further improved.
7. The system is not yet complete, and accessibility should be improved.
8. The wording of some questions should be clarified and corrected.
9. The program should be extended beyond 10 days to observe more apparent results.
10. More time should be allocated for the memory exercises.
11. The ability to record historical data would be beneficial.

This article presents feedback and key takeaways from participants of a healthy adults training program that focuses on improving cognitive abilities, emotional regulation, and overall well-being through lifestyle changes.

Woman, Age 42 gave feedback for the key benefits gained as follows;

“Practiced executive functions of the brain, especially for the memory enhancement.”

“It helped me to develop physical strength and fitness and I have learned emotional management for daily life, Including, placed greater importance on self-care through proper nutrition.”

Man, Age 48 gave feedback for the key benefits gained as follows;

“Practiced concentration through breathing exercises.”

“Learned to plan and manage daily life with discipline.”

“Practiced focus and prioritization of life activities.”

“Nurtured cognitive health through diet, exercise, and proper sleep.”

“Continuously trained to improve memory.”

“Suggestion: Develop a more stable app to better facilitate cognitive training.”

It can be concluded the HBM program might help participants to enhance their cognitive, mind and health that contribute them to be healthy through their life even in old age.

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Contact emails: juthamas@go.buu.ac.th
drhaenjohn@gmail.com