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Original Scientific Article

Thai Cultural Dance with Ruesi Dadton (traditional Thai exercise): The Effects on Physical Health, Cognitive Performance, and Quality of Life in Older Adults

Pitchanan Thiantongin[1ABCD], Phaksachiphon Khanthong[1ABCDE], Siriwan Janjang[1BED], Chaiyawat Namboonlue[1BD], Savitree Thaotho[1BD] and Surasak Suksai[2BD]

[1]Ubon Ratchathani Rajabhat University
[2]Ban Hua Don Sub-district Health Promoting Hospital

Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

Corresponding Author: Phaksachiphon Khanthong, e-mail: phaksachiphonk@gmail.com
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Abstract

Background. Regular physical activity offers substantial benefits for older adults. However, it must be varied and engaging to sustain their participation. Lampleon Ruesi Dadton (LRD), a form of Thai cultural dance, has been developed as an integrated exercise program specifically tailored for older adults.

Objectives. This pilot study aimed to investigate the effects of LRD on physical health, cognitive performance, and quality of life (QoL) among eleven older adult women.

Materials and Methods. Participants attended 20-minute LRD dance sessions three times per week for four weeks. The assessment of physical health, cognition, and QoL was conducted. Physical performance was evaluated using the Timed Up and Go (TUG) test for balance, two dynamometers to measure handgrip strength and back-and-leg strength, and the Sit-and-Reach test to assess flexibility.

Results. Significant improvements in physical health were demonstrated by the TUG test ($p = 0.014$) and Sit-and-Reach test ($p = 0.035$). In terms of QoL, notable gains were observed in the social relationship domain ($p = 0.008$) and overall QoL ($p = 0.010$).

Conclusions. The present findings indicate that LRD has the potential to improve physical health and QoL among older adults. Overall, Thai cultural dance incorporating Ruesi Dadton represents a feasible and promising strategy for health promotion in this population. Further research, including long-term follow-up and randomized controlled trials, is warranted to confirm these preliminary results.

Keywords: cognition, dancing, exercise, integrative medicine, physical functional performance, quality of life.

Introduction

Thailand, the second-fastest aging country in ASEAN (Glinskaya et al., 2021), is prioritizing older persons' welfare through policies, community-based care, and volunteer-supported long-term care to address age-related physical decline, frailty (To et al., 2022), and sarcopenia (Wang, 2024). To counter these declines, international guidelines recommend regular physical activity as a key strategy for promoting healthy longevity (Izquierdo et al., 2025).

Adequate and appropriate physical activity is linked to substantial health benefits in this population (Izquierdo et al., 2021). Even among acutely hospitalized older individuals, daily physical activity is recommended, including approximately 40 minutes of light-intensity activity and 25 minutes of moderate-intensity activity (Gallardo-Gómez et al., 2023). Randomized controlled trials indicate that dance-based exercise benefits both cognitive and physical health (Esmail et al., 2020), while systematic reviews and meta-analyses demonstrate its efficacy in improving muscle strength, balance, and flexibility in older adults (Hwang & Braun, 2015; Sooktho et al., 2022).

Cultural dance represents an alternative form of physical activity that has been widely adopted worldwide

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to promote exercise participation and improve health outcomes among older adults (Mishra & Shukla, 2022). In Thailand, cultural dance programs incorporating cognitive stimulation have been shown to significantly enhance cognitive performance in this population (Sanprakhon et al., 2025). Likewise, other Thai cultural dance interventions have demonstrated beneficial effects on postural control and balance, highlighting their potential role in fall-prevention strategies for older adults (Noopud et al., 2019).

Lam Plearn Ruesi Dadton (LRD) is a dance-based exercise program, culturally inspired by Ruesi Dadton postures and incorporating the Lam Plearn musical style from northeastern Thailand. Although Ruesi Dadton exercises have demonstrated benefits for older adults (Khanthong et al., 2022), the effectiveness of this recently developed cultural dance program has not yet been established. Furthermore, few studies have explored how combining traditional postures with culturally meaningful music may influence physical performance, cognitive function, and quality of life (QoL) in community-dwelling older adults. Addressing this gap, the present study investigates the short-term effects of LRD over a four-week intervention, highlighting an approach that integrates cultural health practices with evidence-based strategies to support healthy aging in culturally diverse populations.

Materials and Methods

Study participants

A single-group, pre–post quasi-experimental study was conducted in March 2025 among 11 female older adults at the Older Adults Club of the Ubon Ratchathani Provincial Administrative Organization. Eligible participants were community-dwelling individuals aged 60 to 79 years who voluntarily provided informed consent. Inclusion criteria required participants to be able to communicate in Thai, perform independent self-care, and have no history of regular exercise prior to enrollment. Exclusion criteria included medical conditions that contraindicated physical activity, such as acute arthritis or acute coronary artery disease. Individuals with severe neurological impairments—such as residual deficits following a stroke—or diagnosed psychiatric disorders were also excluded. Participants with uncontrolled chronic conditions, including hypertension exceeding 160/90 mmHg, were considered ineligible. Additionally, participants who attended fewer than 50% of the scheduled exercise sessions (i.e., fewer than six sessions) were excluded from the final analysis.

This study employed a sample size based on recommendations from a previous pilot study (Sarafadeen et al., 2020), which suggested recruiting between 10 and 12 participants. Ethical approval was granted by the Human Research Ethics Committee of the Ubon Ratchathani Provincial Public Health Office (Approval No. SSJ.UB 01.004). Written informed consent was obtained from all participants prior to recruitment. The study was prospectively registered with the Thai Clinical Trials Registry (TCTR) under the identification number TCTR20250416008.

Experimental Design

The LRD postures were developed based on 15 traditional Ruesi Dadton postures (Khanthong et al., 2024) provided by the Thai Ministry of Public Health. Figure 1 presents the structure of the LRD dance exercise, which consisted of three phases: warm-up, main dance exercise, and cool-down. The warm-up phase comprised seven movements adapted from the northeastern Thai dance style, including pumping fists, side-front arm swings, arm wiggles, trunk twists, body percussion, forward pinch, and pinch circle. The main dance exercise phase was divided into five segments, each incorporating three Ruesi Dadton postures synchronized with the song lyrics and repeated twice, including a reprise of the warm-up postures. The cool-down phase consisted of five Ruesi Dadton postures performed with verbal guidance to promote deep breathing.

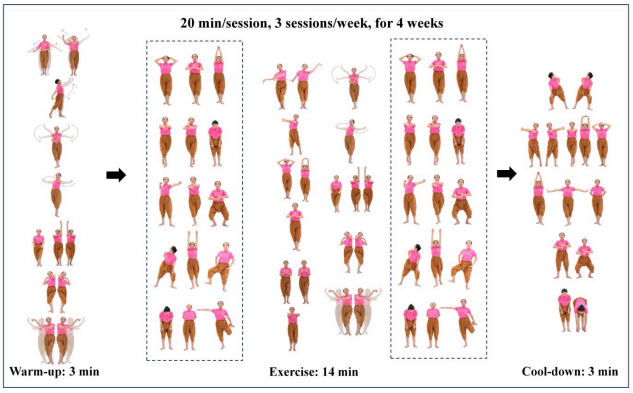

Fig. 1. Lam Plearn Ruesi Dadton dance protocol

Study procedure

Outcome measurements were collected before and after participation in the LRD dance exercise program. The intervention began with a three-day training course that provided participants with essential knowledge on physical exercise for older adults, the Lam Plearn rhythm and dance style, and Ruesi Dadton exercises. Eleven participants took part in the LRD intervention, which consisted of 20-minute sessions held three times per week (Monday, Wednesday, and Friday) over four consecutive weeks at 8:30 a.m. Each session was guided by an instructor with visual support from a recorded Lam Plearn Ruesi Dadton instructional video projected on a screen.

The LRD were performed at an intensity corresponding to 40–60% of each participant's maximum heart rate (HRmax). Exercise intensity was monitored and controlled using a Heart Zones device (Rhythm+2.0; Scosche Industries, P.R.C.). The training program was conducted without implementing exercise progression. Posture and rhythm were supervised and corrected by the researchers (PK and PT) to ensure proper technique. All sessions were conducted in a safe environment with drinking water available at all times. The exercise sessions were conducted at the Center for the Promotion and Development of Older Adults' Well-being, Ubon Ratchathani Rajabhat University, which is located in close proximity to the university's Thai Traditional Medicine Clinic to ensure participant safety.

Measurements

1. Physical assessments

Four physical assessment stations—balance, grip strength, leg press, and flexibility—were administered sequentially. Each assessment was performed three times, with a two-minute rest

between trials. All evaluators held degrees in health sciences and were trained by the researcher (PK), a physical therapist.

The Timed Up and Go (TUG) test was employed to evaluate dynamic balance. A 3-meter path was clearly marked on the floor with directional arrows, and a pillar was positioned at the turnaround point to guide movement. A Thai traditional medicine student provided standardized instructions and demonstrated the procedure to ensure participants fully understood the protocol. The stopwatch was activated as the participant rose from the chair, walked 3 meters, turned at the designated point, and returned to sit down. Timing was stopped once the participant was fully seated, and the duration was recorded in seconds. The fastest time from the three trials was used for analysis.

Grip strength was measured using a hydraulic hand dynamometer (model J00105, Lafayette Instrument Company, Lafayette, IN, USA). The test was performed on the dominant hand. Participants were seated with their forearm positioned close to the body, the elbow flexed at 90 degrees, and the wrist maintained in a neutral (mid-prone) position. The highest grip strength value from the trials was recorded for analysis.

The Back and Leg Strength Dynamometer (Back-A Takei Physical Fitness Test; model T.K.K. 5002, Japan) was used to assess the back-and-leg strength ratio. Participants stood on the platform with their knees flexed at approximately 110°, grasped the handle, and exerted maximal force through their legs. The highest force output (in kilograms) was recorded and then normalized by dividing it by the participant's body weight (in kilograms), resulting in a dimensionless ratio.

Sit-and-Reach box (Model 383040, Grand Sport, Thailand) was used to measure the flexibility of the lower back and hamstrings. Prior to testing, participants completed a standardized warm-up consisting of a 10-minute easy-paced walk and four static stretching exercises targeting major muscle groups. Each stretch was held for 10 seconds and repeated twice. The stretches included a standing quadriceps stretch, hamstring stretch, chest stretch, and side bend stretch. After the warm-up, participants sat on the floor with their legs fully extended and the soles of their feet flat against the Sit-and-Reach box, positioned firmly against a wall. With hands overlapping, they were instructed to slowly reach forward as far as possible without bending their knees, pushing the measurement slider forward. The final position was held for two seconds, and the maximum reach distance was recorded in centimeters.

2. Cognitive assessments

Cognitive function was assessed by an experienced psychiatrist using three standardized tools: Verbal Fluency (VF), Trail Making Test Part A (TMT-A), and Part B (TMT-B). The VF test evaluated memory function by instructing participants to name as many animals as possible within one minute. The TMT-A and TMT-B, using the TMT–Thai Modification version (Chompukum & Wongphaet, 2007), assessed executive function; participants were required to connect a sequence of numbers (TMT-A) and to alternate between numbers and letters (TMT-B). The psychiatrist provided standardized instructions for each task and recorded completion times in seconds using a stopwatch.

3. QoL

The Thai abbreviated version of the World Health Organization Quality of Life questionnaire (WHOQOL-BREF-THAI) comprises 26 items, assessed using a 5-point Likert scale ranging from 'none' to 'very much.' The items are distributed across four domains: physical health, psychological well-being, social relationships, and environmental conditions (Mahatnirunkul et al., 1998). Each domain is categorized into three levels—low, average, and good—based on specific score ranges. For the physical health domain, scores of 7–16 indicate a low level, 17–26 an average level, and 27–35 a good level. The psychological domain is classified as low (6–14), average (15–22), and good (23–30). The social relationships domain is categorized as low (3–7), average (8–11), and good (12–15). For the environmental domain, scores of 8–18 indicate a low level, 19–29 an average level, and 30–40 a good level. The total score, ranging from 26 to 130, is similarly divided into low (26–60), average (61–95), and good (96–130) levels of overall quality of life.

Statistical analysis

Data were analyzed using Jamovi (version 2.2.3.0). Normality was assessed with the Shapiro–Wilk test, which indicated non-normal distributions for most variables; therefore, non-parametric tests were applied. The Wilcoxon signed-rank test evaluated pre–post differences, and effect sizes were reported as rank-biserial correlations (r), interpreted as small (0.1), medium (0.3), and large (0.5).

Results

Firstly, all participants were informed about the intervention and provided written informed consent prior to enrolment. Twelve participants met the eligibility criteria, but one left for another province after two weeks and was excluded. The socio-demographic characteristics of the remaining 11 participants are presented in Table 1.

Table 1. Socio-demographic characteristics of the participants (n = 11)

Variable		Frequency (%), Mean ± SD
Age (year)	60-64	2 (18.2)
	65-69	2 (18.2)
	70-74	3 (27.3)
	75-79	4 (36.4)
Marital status	Single	2 (18.2)
	Widowed	5 (45.4)
	Married	4 (36.4)
Educational level	Bachelor's degree	7 (63.6)
	Graduate education	4 (36.4)
Occupational status	None	3 (27.3)
	Retired government officials	8 (72.7)
Social activities	Occasionally	3 (27.3)
	Regularly	8 (72.7)
Exercise frequency	Occasionally	6 (54.5)
	Regularly	5 (45.5)
Religious activities	Occasionally	8 (72.7)
	Regularly	3 (27.3)
Number of regularly taken medications		1.91 ± 1.81

Table 2. Pre-and post-assessment of physical and cognitive performance (n = 11)

Variable	(Mean ± SD)				95% CI	p	r
	Pre	Post	Change score	Δ (% Change)			
TUG (s)	8.76 ± 0.99	8.10 ± 0.79	0.66 ± 0.73	8.39 ± 0.09	0.10, 1.12	0.014*	0.818
Grip strength (kg)	25.70 ± 4.45	25.40 ± 5.33	-0.36 ± 2.80	-1.53 ± 0.11	-3.00, 3.50	0.734	0.179
Back-and-leg strength ratio	79.50 ± 18.6	83.00 ± 23.90	0.06 ± 0.32	5.36 ± 0.23	-15.00, 6.75	0.286	-0.379
Sit-and-Reach (cm)	10.60 ± 6.45	11.90 ± 6.17	1.27 ± 1.62	23.41 ± 0.32	-3.50, 1.00	0.035*	-1.000
VF (words)	18.50 ± 3.27	20.50 ± 4.18	2.00 ± 3.92	12.63 ± 0.24	-5.50, 1.00	0.138	-0.545
TMT-A (s)	47.10 ± 26.00	44.00 ± 15.80	3.09 ± 24.02	8.44 ± 0.47	-9.00, 23.00	0.700	-0.152
TMT-B (s)	109.00 ± 47.60	123.00 ± 44.60	14.55 ± 39.10	-8.46 ± 0.33	-46.00, 13.00	0.221	-0.455

* showed statistically significant results ($p < 0.05$). Note: a positive change score indicates improvement. SD = standard deviation; CI = confidence interval; r = Rank biserial correlation from Wilcoxon signed-rank test; TUG = Timed Up and Go; kg = Kilograms; BW = Body weight; VF = Verbal Fluency; TMT-A = Trail Making Test Part A; TMT-B = Trail Making Test Part B

Table 3. Pre- and post-assessment of QoL domains and overall score (n = 11)

QoL domain		(Mean ± SD)		95% CI	p	r
		Pre	Post			
Physical health	score	27.50 ± 3.17	29.50 ± 2.84	-5.00, 1.00	0.196	-0.455
	level	Good	Good			
Psycho-logical	score	25.20 ± 2.56	27.00 ± 2.49	-4.00, 0.50	0.084	-0.667
	level	Good	Good			
Social relation-ship	score	11.70 ± 1.56	13.60 ± 1.12	-3.00, 2.00	0.008*	-1.000
	level	Average	Good			
Environ-mental	score	32.80 ± 2.75	34.20 ± 2.89	-4.00, 1.00	0.148	-0.527
	level	Good	Good			
Total	score	105.00 ± 7.76	114.00 ± 7.13	-14.00, 4.00	0.011*	-0.879
	level	Good	Good			

* showed statistically significant results ($p < 0.05$). Note: QoL = quality of life; SD = standard deviation; CI = confidence interval; r = Rank biserial correlation from Wilcoxon signed-rank test; QoL = Quality of life

The physical and cognitive performance outcomes are summarized in Table 2. Significant improvements were observed in the TUG test ($p = 0.014$, $r = 0.818$, 95% CI [0.10, 1.12]) and the Sit-and-Reach test ($p = 0.035$, $r = -1.000$, 95% CI [-3.50, 1.00]). The TUG demonstrated at 8.39 ± 0.09% improvement in delta change scores, while the Sit-and-Reach test showed the highest delta change at 23.41 ± 0.32%. Cognitive performance outcomes did not reach statistical significance; however, a large effect size was observed for the VF test ($r = –0.545$), which demonstrated a 12.63 ± 0.24% improvement in delta change scores.

All QoL domains demonstrated medium to large effect sizes, with significant differences observed in the total QoL score and the social relationships domain (Table 3). Additionally, the social relationships domain improved from an average to a good level, with the highest effect size among all domains.

Discussion

The present study found that participation in LRD dance-based exercise for 20 minutes, three times per week over a four-week period resulted in significant improvements in dynamic balance, flexibility, and QoL among older adult women. Although the improvement in VF did not reach statistical significance, the large effect size indicates a potentially meaningful cognitive benefit. These outcomes align with a mechanistic framework suggesting that regular participation in dance enhances physical function, stimulates cognitive processes, and supports social connection (Rice et al., 2025).

For physical health outcomes, balance, strength, and flexibility were evaluated. Dynamic balance, as measured by the TUG test, showed a statistically significant improvement with a large effect size. This enhancement is likely attributable to the continuous and rhythmic movements characteristic of LRD, which may directly improve functional mobility. Previous systematic reviews and meta-analyses have demonstrated that dance-based exercise significantly improves TUG performance (Mattle et al., 2020) and may contribute to reducing fall risk (Li et al., 2024) and fall incidence (Liu et al., 2021) among older adults.

No significant changes were observed in grip strength or back-and-leg strength ratio following the intervention. Consistent with a previous study on Ruesi Dadton,

participants maintained, rather than improved, grip strength after a three-month intervention, whereas the control group showed a significant decline (Khanthong et al., 2021). A medium effect size was observed for back-and-leg strength ratio, while grip strength showed a small effect size. These findings are supported by systematic reviews and meta-analyses indicating that dance-based interventions in older adults generally improve lower-body strength but have limited effects on upper-body strength (Mattle et al., 2020).

The Sit-and-Reach test showed a statistically significant improvement, accompanied by a large effect size. This gain may be attributed to the inclusion of specific Ruesi Dadton postures, particularly those performed during the cool-down phase. Similar improvements in flexibility among older adults have been observed in previous studies involving Ruesi Dadton (Khanthong et al., 2021, 2022) and cultural dance interventions (Douka et al., 2019).

Three questionnaires were used to assess executive function: VF, TMT-A, and TMT-B. Although none of the changes reached statistical significance, VF demonstrated a large effect size and the highest percent change compared with TMT-A and TMT-B. These findings suggest a potential improvement in cognitive outcomes, which is supported by systematic reviews and meta-analyses indicating that dance interventions may enhance global cognitive function and executive function in older adults adults (Predovan et al., 2019; Hewston et al., 2021), including those with mild cognitive impairment (Huang et al., 2023).

Statistically significant improvements in QoL were observed only in the social relationships domain and the total QoL score. Nevertheless, large effect sizes were observed across all domains, except for physical health, which showed a medium effect size. The greatest improvement occurred in the social relationships domain, likely reflecting the frequent interpersonal interactions participants experienced during the program. These findings correspond with systematic reviews indicating that dance-based exercise can enhance QoL and promote physical activity among older adults (Lu et al., 2024). Furthermore, such interventions have been reported to improve emotional and social well-being, particularly by strengthening interpersonal connections that may help mitigate loneliness (Fonseca et al., 2025).

This study has several limitations. First, the small sample size and short intervention period may have limited the ability to detect statistically significant effects. Second, the absence of a control group and the lack of blinding may have introduced potential biases, including expectancy and placebo effects. Third, the relatively low exercise volume—20 minutes per session, three times per week, totaling 60 minutes—may have been insufficient to elicit measurable changes. Future studies should employ larger sample sizes, adopt randomized controlled trial designs, and investigate the impact of varying exercise volumes.

Conclusions

In conclusion, the findings suggest that LRD is a feasible intervention for improving physical performance and QoL in older adults. While cognitive improvements did not reach statistical significance, the observed large effect size for VF indicates a potential benefit that deserves further investigation.

Acknowledgment

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Conflict of interest

The authors declare that they have no financial, personal, or professional conflicts of interest that could have influenced this study.

AI Disclosure

No artificial intelligence tools were used in the preparation of this manuscript.

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Тайський культурний танець в комбінації з Ruesi Dadton (традиційними тайськими вправами): Вплив на фізичне здоров'я, когнітивну працездатність та якість життя в осіб похилого віку

Пітчанан Тіантонґін[1ABCD], Пхаксачіпхон Хантхонг[1ABCDE], Сіріван Джанджанґ[1BED], Чайяват Намбунлуе[1BD], Савітрі Таото[1BD], Сурасак Суксай[2BD]

[1]Університет Раджабхат Убон Ратчатхані
[2]Лікарня сприяння здоров'ю громади Бан Хуа Дон

Авторський вклад: A – дизайн дослідження; B – збір даних; C – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 10 с., 3 табл., 1 рис., 28 джерел.

Історія питання. Регулярна фізична активність пропонує суттєві переваги для осіб похилого віку. Однак, щоб забезпечити залученість даної категорії осіб до зазначеного процесу, така діяльність має бути різноманітною та цікавою. Lampleon Ruesi Dadton (LRD) — форма тайського культурного танцю, яка розроблена як інтегрована програма вправ, спеціально адаптована для осіб похилого віку.

Мета дослідження. Метою цього пілотного дослідження було вивчення впливу методики LRD на фізичне здоров'я, когнітивну працездатність та якість життя (ЯЖ) серед одинадцяти жінок похилого віку.

Матеріали та методи. Учасники відвідували 20-хвилинні заняття з танцю LRD тричі на тиждень протягом чотирьох тижнів. Проведено оцінку фізичного здоров'я, когнітивних функцій та якості життя. Фізичну працездатність оцінювали за допомогою використання тесту «Встань та йди» (Timed Up and Go, TUG) для перевірки рівноваги, двох динамометрів для вимірювання сили хвату кистей рук та сили спини і ніг, а також тесту Sit-and-Reach (згинання тулуба вперед, сидячи на підлозі з витягнутими вперед руками) з метою оцінки гнучкості.

Результати. Значні поліпшення показників фізичного здоров'я продемонстровано за допомогою тесту TUG ($p = 0.014$) і тесту Sit-and-Reach ($p = 0.035$). Що стосується якості життя, помітні покращення спостерігалися в галузі соціальних відносин ($p = 0.008$) і загальної якості життя ($p = 0.010$).

Висновки. Отримані результати свідчать про потенціал застосування методики LRD у поліпшенні фізичного здоров'я та якості життя серед людей похилого віку. Загалом, тайський культурний танець, що включає Ruesi Dadton, є доцільною та перспективною стратегією щодо зміцнення здоров'я цієї групи населення. Для підтвердження зазначених попередніх результатів необхідні подальші дослідження, включаючи довгострокове спостереження та рандомізовані контрольовані випробування.

Ключові слова: когніція, танці, фізичні вправи, інтегративна медицина, фізична функціональна працездатність, якість життя.

Information about the authors:

Thiantongin, Pitchanan: pitchanan.t@ubru.ac.th, https://orcid.org/0000-0001-9578-6875; Faculty of Thai Traditional and Alternative Medicine, Ubon Ratchathani Rajabhat University, 2 Ratchathani Road, Nai-Muang, Muang District, Ubon Ratchathani, 34000, Thailand.

Khanthong, Phaksachiphon: phaksachiphonk@gmail.com, https://orcid.org/0000-0003-2421-3900; Faculty of Thai Traditional and Alternative Medicine, Ubon Ratchathani Rajabhat University, 2 Ratchathani Road, Nai-Muang, Muang District, Ubon Ratchathani, 34000, Thailand.

Janjang, Siriwan: siriwan.j@ubru.ac.th, https://orcid.org/0009-0008-1474-7646; Faculty of Education, Ubon Ratchathani Rajabhat University, Ubon Ratchathani 34000, Thailand.

Namboonlue, Chaiyawat: chaiyawat.n@ubru.ac.th, https://orcid.org/0009-0000-7662-9559; Program of Sports and Exercise Science, Faculty of Science, Ubon Ratchathani Rajabhat University, 2 Ratchathani Road, Nai-Muang, Muang District, Ubon Ratchathani, 34000, Thailand.

Thaotho, Savitree: savitree.t@ubru.ac.th, https://orcid.org/0000-0001-7150-2487; Faculty of Education, Ubon Ratchathani Rajabhat University, Ubon Ratchathani 34000, Thailand.

Suksai, Surasak: surasak999@hotmail.com, https://orcid.org/0009-0006-5677-9297; Ban Hua Don Sub-district Health Promoting Hospital, Ubon Ratchathani, 34150, Thailand.

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