



THE SADHU MODEL: A FEASIBILITY-ORIENTED APPLIED BUDDHIST FRAMEWORK FOR RECREATIONAL PHYSICAL ACTIVITY AMONG AGEING MONKS IN RURAL THAILAND

Tachapon Tongterm

Faculty of Liberal Arts and Sciences, Sisaket Rajabhat University, Sisaket, Thailand

Corresponding author E-mail: tachapon.t@sskru.ac.th

Received 17 May 2026; Revised 23 July 2026; Accepted 1 September 2026

Abstract

Background and Objectives: Population ageing raises concerns regarding functional decline, frailty, and the sustainability of independent living. Ageing Buddhist monks represent a specialised ageing population whose functional capacity is shaped by biological ageing and the institutional structure of monastic life, including the Vinaya, meaning monastic discipline, and samana-sarupa, meaning appropriate monastic conduct. Conventional exercise programmes may not fit these conditions, creating a need for physical activity approaches compatible with daily religious practice. This study aimed to examine the implementation of the SADHU Model, a context-specific Buddhist-based recreational physical activity framework, among ageing monks in rural Thailand; To describe preliminary trends in health-related functional fitness; And to assess participant satisfaction and perceived feasibility within a feasibility-oriented framework.

Methodology: The intervention phase reported in this article formed part of a broader mixed-methods research project and employed a quantitative quasi-experimental one-group pretest-posttest design with descriptive feasibility assessment. Thirty ageing Buddhist monks aged 50 years and above from rural temples in Sisaket Province, Thailand, participated in an intervention lasting 12 weeks. The SADHU Model reorganised existing monastic routines into structured opportunities for extremely light to very light intensity recreational physical activity, corresponding to ratings of 7 to 9 on the Borg 6 - 20 Rating of Perceived Exertion (RPE) scale. The intervention incorporated inherent monastic routines, supportive temple-based activities, and structured movement practices. Health-related functional fitness was assessed using the Senior Fitness Test, while participant satisfaction and perceived feasibility were assessed using a researcher-developed 10-item, five-point rating scale. Data were analysed using descriptive statistics and paired-samples t-tests, with statistical significance set at $p < .05$.

Main Results: Mean scores changed in a favourable direction across cardiovascular endurance, upper- and lower-body strength, lower- and upper-body flexibility, and agility with dynamic balance; However, none of the observed changes met the prespecified threshold for statistical significance ($p = .052$ to $.08$). The mean 2-Minute Step Test score increased from 105.57 ± 13.06



to 106.93 ± 11.68 repetitions, while the mean 8-Foot Up-and-Go Test completion time decreased from 7.66 ± 1.17 to 7.53 ± 1.14 seconds. Overall participant satisfaction was high (4.01 ± 0.73), and perceived benefit was rated very high (4.23 ± 0.57). These findings were interpreted as a preliminary pattern consistent with short-term functional stability and perceived contextual acceptability, rather than as evidence of physiological improvement or intervention efficacy.

Involvement to Buddhadhamma: This study is classified within Applied Buddhism because it applies Buddhist principles to the sustainable development and implementation of a context-specific health-related process model. The SADHU Model situates bodily movement within disciplined and attentive monastic practice. The Vinaya and samana-sarupa provide contextual grounds for ensuring that activities remain compatible with monastic conduct, while sati, meaning mindfulness, and appamāda, meaning heedfulness, inform the rationale for measured, careful, and context-appropriate movement. These principles function as contextual foundations for activity design and method development rather than as clinical explanations for the observed outcomes.

Conclusions: The findings did not demonstrate statistically significant physiological improvement or causal intervention efficacy. Rather, they showed that the SADHU Model was implemented within daily monastic routines and was accompanied by favourable directional changes in health-related functional fitness, while participants reported high satisfaction indicative of perceived feasibility. SADHU should therefore be understood as an empirically informed, context-sensitive Applied Buddhist model for organising recreational physical activity within monastic routines. Controlled studies with larger samples, longer follow-up periods, and additional functional outcomes are needed to examine its longer-term implications.

Keywords: Ageing Monks, Functional Fitness, Recreational Physical Activity, Buddhist Monastic Life, Sustainable Development

Introduction

Thailand is experiencing population ageing alongside profound changes in family structure, community care, economic security, and access to health and social resources. Older adults increasingly live with chronic disease, loneliness, financial insecurity, and reduced family-based caregiving, while rural communities continue to rely on temples as moral, social, and health-supportive spaces (Akarathanarak & Sukonthasab, 2024). Within this changing social landscape, ageing Buddhist monks represent a specialised ageing population. They are not only older adults experiencing physiological decline, but also members of a religious institution whose daily life is shaped by alms-based food dependence, temple duties, community expectations, and regulated bodily conduct. From a sports and recreation science perspective, these conditions are important because ageing is associated with progressive reductions in muscle strength, neuromuscular coordination, aerobic capacity, flexibility, and balance, all of which are essential for maintaining daily function and physical independence (Izquierdo et al., 2025).

For ageing monks, functional capacity is expressed through ordinary but essential actions within monastic life: Walking for alms, rising from seated postures, maintaining balance on temple



grounds, cleaning temple spaces, and participating in routine monastic duties. These actions are not athletic performances; They are the functional basis of daily religious life. Evidence from Thailand indicates that Buddhist monks experience substantial health vulnerabilities, including noncommunicable diseases, obesity, and hypertension (Jeamjitvibool et al., 2022); (Ko-amornsap et al., 2024), as well as medication-related concerns and diabetes-related self-management challenges (Chisana et al., 2023); (Codrington et al., 2025). These vulnerabilities are closely linked to structural determinants of temple life, including dependence on donated food, limited autonomy in food selection, restricted opportunities for regular physical activity, and the expectation that monks continue to serve as spiritual and community figures even as their own bodies age. Similar challenges have also been reported in other Buddhist contexts, where ageing monastic communities face growing concerns related to long-term care, institutional support, and functional participation (Park & Kim, 2025). Health-related functional fitness, therefore, provides an appropriate framework for examining the physical capacities required for ordinary monastic life.

A major challenge in promoting physical activity among ageing monks is that conventional exercise programmes may not fit the discipline, rhythm, and bodily expectations of monastic life. The Vinaya, meaning monastic discipline, and samana-sarupa, meaning appropriate monastic conduct, shape how monks move, behave, eat, rest, and participate in daily routines (Panyachit, 2026). Exercise formats designed for lay older adults may be difficult to apply directly when they are perceived as external to temple life, overly performance-oriented, or inconsistent with monastic comportment. Within the Pali Canon, the Satipatthāna Sutta identifies awareness of walking, standing, sitting, and lying down as part of attention to bodily experience (MN 10), while the Dhammapada presents appamāda as heedful and non-negligent conduct (Dhp 21 - 23). These doctrinal references do not function as clinical evidence; Rather, they clarify why attentive and moderated movement may be contextually compatible with monastic life. This creates a contemporary problem for sports and recreation science: How can health-supportive movement be organised for a population whose physical activity must remain compatible with religious discipline, limited resources, community expectations, and changing systems of care? The issue is not simply whether monks should exercise, but how functional movement can be embedded within existing monastic routines without adding unnecessary burden or disrupting religious practice. Evidence on Buddhist walking meditation and mindful walking further suggests that such practices warrant careful examination as contextually relevant health-related activities, although existing studies remain heterogeneous in their populations, formats, and outcomes (Montalva-Valenzuela et al., 2025).

Despite increasing attention to monks' health conditions, frailty-related vulnerability, medication issues, mental health, and health behaviours, limited empirical evidence exists on routine-embedded recreational physical activity models that are compatible with monastic discipline and assessed through health-related functional fitness outcomes (Chisana et al., 2023); (Langgapin et al., 2024); (Prapassorakul & Yotsombut, 2025). This gap is important because physical activity interventions are more likely to be acceptable and sustainable when they are aligned with everyday social, cultural, and environmental contexts (Zubala et al., 2017). The SADHU Model



was developed to address this gap by reorganising existing monastic routines into structured opportunities for extremely light to very light intensity recreational physical activity rather than introducing exercise as a separate programme. The model was designed to organise routine monastic activities, individual adaptation, safety procedures, and participatory reflection into a repeatable, context-specific recreational physical activity process. This design distinguishes the SADHU Model from monk-focused initiatives that have primarily emphasised health promotion through community participation or mental health support, rather than the systematic organisation of daily monastic movement in relation to health-related functional fitness assessment (Langgapin et al., 2024). In this study, functional stability was specified as a study-specific interpretive framework for examining health-related functional fitness within the structural conditions of monastic life. The contribution of this study lies in examining the feasibility of embedding Buddhist-based recreational physical activity within monastic routines under contemporary social, monastic, and structural constraints.

Objectives

This study aimed to examine the implementation of the SADHU Model, a context-specific Buddhist-based recreational physical activity framework, among ageing monks in rural Thailand; To describe preliminary trends in health-related functional fitness; And to assess participant satisfaction and perceived feasibility within a feasibility-oriented framework.

Methodology

This study constituted the intervention phase of a broader mixed-methods research project on Buddhist-based health promotion for ageing monks in rural Thailand. It employed a quantitative quasi-experimental one-group pretest-posttest design to examine the implementation of the SADHU Model within daily monastic routines and preliminary trends in health-related functional fitness.

Methodological Positioning

Earlier phases of the broader project examined community food-offering practices, self-health-management behaviours among ageing monks, and the roles of local administrative organisations and primary healthcare services in monastic health promotion. These findings informed the contextual development and refinement of the SADHU Model before field implementation. Given the exploratory and context-specific nature of the intervention, the present phase was positioned as a feasibility-oriented quasi-experimental study rather than a full-scale effectiveness trial. Health-related functional fitness was the measured outcome, whereas functional stability was used as a study-specific interpretive framework describing the absence of measurable decline or the presence of slight favourable directional change across the measured indicators during the intervention period. This interpretive approach was adopted because functional fitness serves as a practical indicator of older adults' ability to perform daily activities (Izquierdo et al., 2025).

Study Design, Ethical Considerations, and Participants

A quasi-experimental one-group pretest-posttest design was used because random assignment and a control group were not feasible in real-world rural temple settings. The study



was approved by the Human Research Ethics Committee of Sisaket Rajabhat University (Approval No. HE641001), and informed consent was obtained from all participants before enrolment. Procedures were designed to align with the Vinaya, meaning monastic discipline, and samana-sarupa, meaning appropriate monastic conduct (Panyachit, 2026). Field photographs were included solely as documentation of intervention delivery and assessment procedures. Identifiable images were retained only when permission for publication had been documented; Otherwise, identifying features were obscured before manuscript submission.

The study was conducted in Bakdong Subdistrict, Khun Han District, Sisaket Province, Thailand. The area was selected because it had a substantial population of ageing monks, safe conditions for field implementation, and cooperation from local monastic and community leaders. A purposive sample of 30 Buddhist monks aged 50 years and above was recruited from temples in the study area. The age threshold was selected to capture chronic health constraints and functional vulnerability before the conventional older-age threshold of 60 years (Ratanasiri & Lerttrakarnnon, 2019).

Participants were eligible if they were aged 50 years or older, had resided in a temple within the study area for at least one year, were able to perform daily monastic routines independently, and were suitable for participation in extremely light to very light intensity physical activity according to their functional capacity. Monks were excluded if they had severe medical, neurological, or psychiatric conditions; Had mobility, visual, hearing, or other physical limitations that could preclude safe participation; Or had participated in another health-promotion programme during the preceding 6 months. Baseline information, including chronic health conditions, use of assistive devices, perceived effects of health problems on monastic duties, daily functional ability, and relevant health limitations, was recorded before the intervention and summarised descriptively. All 30 enrolled participants completed both the pretest and posttest assessments.

The SADHU Model: Development and Intervention Protocol

The SADHU Model was developed as a context-specific Buddhist-based recreational physical activity framework for ageing monks. Its development incorporated contextual assessment, review of relevant concepts and research evidence, prototype development, expert review, revision, and field implementation over 12 weeks. Rather than introducing conventional exercise as a separate health behaviour, the model reorganised existing monastic routines into structured opportunities for extremely light to very light intensity movement. This approach was selected to maximise contextual fit by embedding movement within the everyday social, cultural, and environmental conditions of monastic life (Zubala et al., 2017).

The model comprised five components: Spiritual-Physical Integration, Adaptability, Disciplined Movement, Holistic Community Care, and Ultimate Well-being. These components guided the alignment of physical activity with functional capacity, monastic discipline, and community support. The content validity of the model components, intervention activities, and related assessment materials was reviewed by a three-member expert panel with expertise in health promotion, physical activity, and Buddhist community health contexts. The review examined congruence between the model components, activity procedures, monastic appropriateness,



functional fitness objectives, and feasibility of implementation in rural temple settings. The Index of Item Objective Congruence was 0.80. Revisions were made following expert feedback to improve the clarity, appropriateness, and contextual fit of the intervention activities.

The intervention was implemented over 12 weeks. Before implementation, participating monks received individualised guidance on sufficient physical activity and health-oriented nutrition and were introduced to the practical application of the activity model. The protocol incorporated three activity categories, as summarised in Table 1. Perceived exertion was monitored using the Borg 6 - 20 Rating of Perceived Exertion (RPE) scale, with target ratings of 7 to 9, corresponding to extremely light to very light intensity (Borg, 1998). Activities were selected because they were compatible with monastic duties, required no specialised equipment, and could be adjusted according to individual functional capacity. Safety procedures included eligibility screening, warm-up and cool-down stretching, monitoring of perceived exertion within the target range, and individualised activity adjustment.

Table 1 Summary of the SADHU Model Intervention Protocol

Activity category	Main activities	Duration and frequency	Intensity	Implementation purpose
Inherent monastic routines	Alms-round walking	Performed according to the actual schedule of each temple; Recommended 6 - 7 days per week	Extremely light to very light intensity, Borg 6 - 20 RPE ratings of 7 - 9	To use routine monastic duties as daily opportunities for ambulatory movement without disrupting religious practice
Supportive temple-based activities	Washing monastic garments, sweeping temple grounds, cleaning monks' residences, trimming vegetation, removing weeds, and other light temple maintenance tasks	Approximately 10 - 20 minutes per day; Recommended 3 - 5 days per week	Extremely light to very light intensity, Borg 6 - 20 RPE ratings of 7 - 9	To organise temple maintenance and self-care tasks as opportunities for functional movement and daily physical engagement
Structured movement practices	Walking meditation, arm-swing walking, brisk walking, and warm-up and cool-down stretching	Approximately 20 - 30 minutes per day; Recommended 3 days per week	Extremely light to very light intensity, Borg 6 - 20 RPE ratings of 7 - 9	To provide planned, repeatable, context-appropriate movement practices compatible with monastic conduct and individual functional capacity

Note: The intervention was implemented over 12 weeks. The protocol specified the inclusion of all three activity categories each week.



Participatory reflection meetings were conducted approximately monthly, resulting in three sessions across an intervention period lasting 12 weeks. These meetings were used to review implementation progress, address practical concerns, and adapt activities when necessary; They were not treated as formal measures of individual adherence. As illustrated in Figure 1, alms-round walking and temple maintenance activities were integrated into daily monastic life during the intervention period. As shown in Figure 2, structured movement practices, assisted participation where required, and post-intervention assessment were conducted within participating temples. The photographs served as field documentation of intervention delivery and assessment procedures rather than as outcome data.



Figure 1 Field Documentation of Functional Integration of Physical Activity into Daily Monastic Routines

The photographs show alms-round walking and temple maintenance activities performed by participating monks during the intervention period. These activities were prescribed at an extremely light to very light intensity and embedded within daily monastic practice. Assistance, when required, reflected adaptation to individual functional capacity while preserving engagement in routine monastic duties.



Figure 2 Field Documentation of Routine-Based Movement and Post-Intervention Assessment in Ageing Monks



The photographs show routine-based movement practice, assisted participation, seated interaction, and post-intervention assessment. They document how the intervention was implemented and adapted to individual functional capacity and how assessment procedures were conducted within real-world monastic settings.

As illustrated in Figure 3, the SADHU Model was implemented through a sequential process conducted over 12 weeks beginning with contextual assessment, individualised guidance, and pretest assessment; Continuing with three routine-based activity categories supported by ongoing adaptation, safety procedures, and participatory reflection; And concluding with posttest assessment and evaluation of participant satisfaction and perceived feasibility.

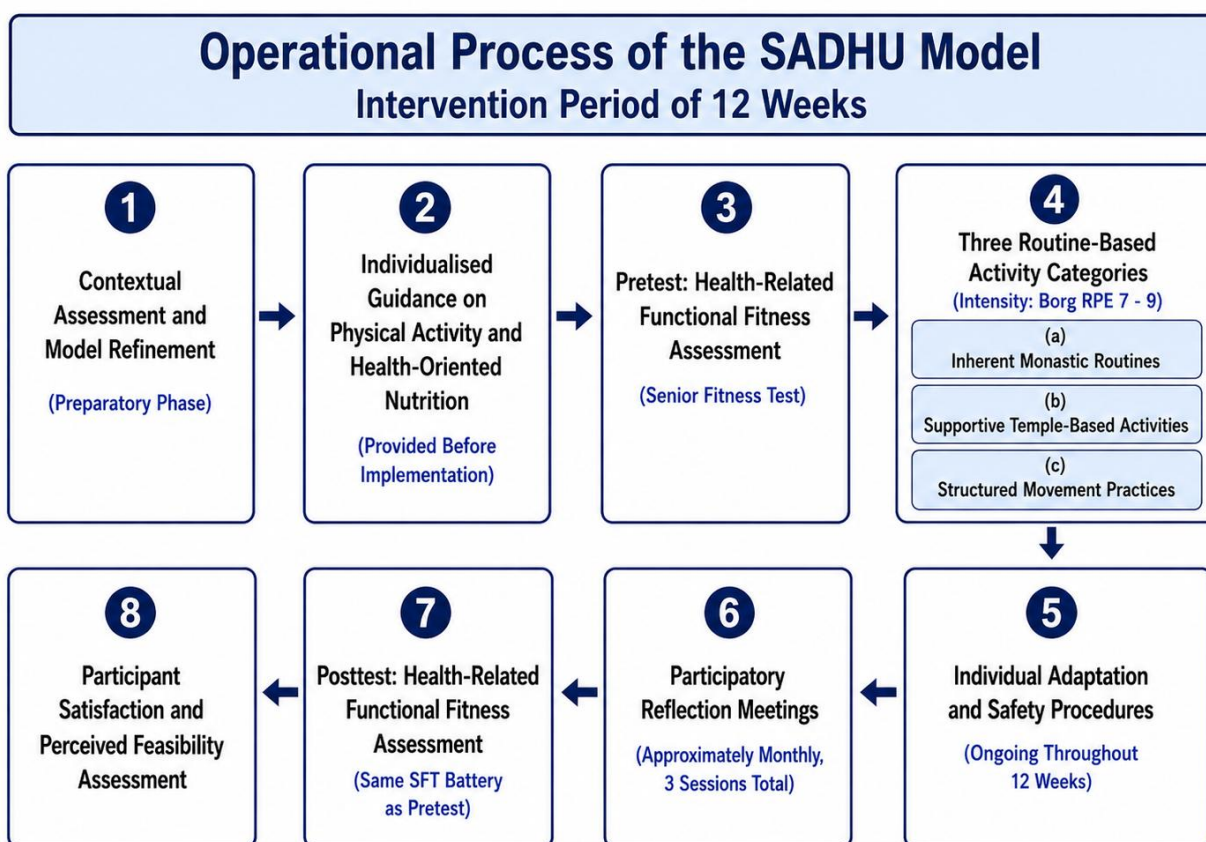


Figure 3 Operational Process of the SADHU Model over 12 Weeks

Outcome Measures and Data Collection

Data were collected at two time points, before the intervention and after 12 weeks of implementation. The same assessment procedures were used at both time points, and the same trained assessors administered the tests using the same standardised testing sequence and equipment.

Health-related functional fitness was assessed using the Senior Fitness Test (Rikli & Jones, 2013), comprising the 2-Minute Step Test for cardiovascular endurance, Arm Curl Test for upper-body strength, Chair Stand Test for lower-body strength, 8-Foot Up-and-Go Test for agility and dynamic



balance, Chair Sit-and-Reach Test for lower-body flexibility, and Back Scratch Test for upper-body flexibility.

Participant satisfaction and perceived feasibility were assessed after completion of the intervention using a researcher-developed 10-item, five-point rating scale. The assessment covered knowledge improvement, attitude towards physical activity, participatory reflection meetings, motivational support, programme relevance, appropriateness of activities, flexibility, knowledge transferability, daily application, and perceived benefit. An overall satisfaction score was calculated descriptively from participants' responses.

Data Analysis

Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarise baseline characteristics, health-related functional fitness outcomes, and participant satisfaction. The normality of pretest-posttest difference scores was examined using the Shapiro-Wilk test before paired-samples t-tests were performed. Pretest and posttest Senior Fitness Test scores were compared using paired-samples t-tests, with statistical significance set at $p < .05$. Given the one-group design and modest sample size, both the statistical results and the direction of change across functional fitness indicators were considered in the interpretation.

Satisfaction scores were analysed descriptively and interpreted using an equal-interval classification with an interval width of 0.80: 1.00 - 1.80 = very low, 1.81 - 2.60 = low, 2.61 - 3.40 = moderate, 3.41 - 4.20 = high, and 4.21 - 5.00 = very high. Satisfaction findings were interpreted as descriptive feedback on perceived feasibility and contextual acceptability, whereas functional stability was interpreted through the study-specific framework described above.

Results and Discussion

Results

The results are presented in four sections: 1) Baseline characteristics and health conditions of the participants, 2) Implementation of the SADHU Model within daily monastic routines, 3) Preliminary trends in health-related functional fitness, and 4) Participant satisfaction and perceived feasibility.

Baseline Characteristics and Health Conditions of Participants

The intervention phase included 30 ageing Buddhist monks who met the eligibility criteria and participated in the implementation of the SADHU Model over 12 weeks. As summarised in Table 2, half of the participants reported chronic diseases or health problems lasting longer than six months, with hypertension being the most commonly reported condition. More than half reported using assistive devices, most commonly eyeglasses. Although most participants reported that health problems did not interfere with monastic duties or routine activities, 40.00% reported some degree of activity-related limitation.



Table 2 Baseline Health Characteristics and Functional Limitations of Participants (n = 30)

Characteristic	n	%
Chronic disease or health problem lasting longer than six months	15	50.00
Hypertension	10	33.33
Use of any assistive device	17	56.67
Use of eyeglasses	16	53.33
Health problems did not interfere with monastic duties or routine activities	18	60.00
Some degree of activity-related limitation	12	40.00

Note: Participants may have reported more than one chronic health condition or assistive device.

Implementation of the SADHU Model within Daily Monastic Routines

The SADHU Model was implemented over 12 consecutive weeks. Before implementation, participating monks received individualised guidance on sufficient physical activity, health-oriented nutrition, and application of the activity model. All three activity categories described in Table 1 were implemented during the intervention period.

Three participatory reflection meetings were conducted over 12 weeks of implementation to review implementation progress and practical issues. As illustrated in Figure 1, alms-round walking and temple maintenance activities were incorporated into daily monastic life. As shown in Figure 2, routine-based movement practices, assisted participation, and post-intervention assessment procedures were conducted within the participating temples.

Preliminary Trends in Health-Related Functional Fitness

Health-related functional fitness was assessed before the intervention and again after 12 weeks using the Senior Fitness Test. As summarised in Table 3, mean scores changed in a favourable direction across cardiovascular endurance, upper- and lower-body strength, lower- and upper-body flexibility, and agility with dynamic balance. The p-values ranged from .052 to .08.

Table 3 Comparison of Health-Related Functional Fitness Before and After the Intervention (n = 30)

Variable	Pre-test $\bar{X}$ (S.D.)	Post-test $\bar{X}$ (S.D.)	t	p-value
2-Minute Step Test (reps)	105.57 (13.06)	106.93 (11.68)	-1.91	.07
Arm Curl Test (reps)	18.77 (2.77)	19.03 (2.67)	-1.86	.07
Chair Stand Test (reps)	15.27 (2.50)	15.50 (2.51)	-1.88	.07
8-Foot Up-and-Go Test (sec)	7.66 (1.17)	7.53 (1.14)	1.99	.06
Chair Sit-and-Reach Test (Left, cm)	12.27 (5.27)	12.37 (5.18)	-1.80	.08
Chair Sit-and-Reach Test (Right, cm)	13.33 (5.02)	13.50 (5.01)	-1.98	.06
Back Scratch Test (Left, cm)	-10.73 (15.31)	-10.52 (15.29)	-2.04	.052
Back Scratch Test (Right, cm)	-8.47 (15.23)	-8.32 (15.10)	-1.87	.07

Note: Higher scores indicate better performance for the 2-Minute Step Test, Arm Curl Test, Chair Stand Test, Chair Sit-and-Reach Test, and Back Scratch Test. A lower completion time indicates better performance for the 8-Foot Up-and-Go Test.

Participant Satisfaction and Perceived Feasibility

Participant satisfaction and perceived feasibility were assessed after 12 weeks of intervention. As summarised in Table 4, overall satisfaction was rated at a high level ($\bar{x}$ = 4.01, S.D. = 0.73). Perceived benefit received the highest mean score and was rated at a very high level ($\bar{x}$ = 4.23, S.D. = 0.57). All other assessed items were rated at a high level. The lowest relative mean scores were observed for participatory reflection meetings ($\bar{x}$ = 3.82, S.D. = 0.79) and daily application of knowledge ($\bar{x}$ = 3.80, S.D. = 0.89); However, both remained within the high-level category.

Table 4 Participant Satisfaction and Perceived Feasibility of the SADHU Model (n = 30)

Item	$\bar{x}$	S.D.	Level
- The guidance provided improved participants' knowledge and understanding of proper health-related practices.	4.00	0.74	High
- The guidance improved participants' attitudes towards physical activity.	4.07	0.64	High
- Participatory reflection meetings helped participants follow the routine-based physical activity model more effectively.	3.82	0.79	High
- The researcher's encouragement supported participants' engagement with the routine-based physical activity model.	4.00	0.74	High
- The activity process was consistent with the objectives of the research project.	4.10	0.66	High
- The routine-based physical activity model included activities appropriate for ageing monks in rural communities.	4.08	0.72	High
- The routine-based physical activity model was flexible and practical for implementation.	4.13	0.78	High
- Participants could transfer knowledge gained from the project to advise fellow monks or other people.	4.16	0.79	High
- Participants could apply knowledge gained from the project in their daily lives.	3.80	0.89	High
- Participants perceived benefits from participation in the research project.	4.23	0.57	Very High
Overall satisfaction	4.01	0.73	High

Note: Mean score interpretation: 1.00 - 1.80 = very low; 1.81 - 2.60 = low; 2.61 - 3.40 = moderate; 3.41 - 4.20 = high; and 4.21 - 5.00 = very high.

Discussion

This study found favourable directional changes in health-related functional fitness and high participant satisfaction after 12 weeks of implementing the SADHU Model among ageing monks in rural Thailand. Because none of the observed changes met the prespecified threshold for statistical significance, the findings should not be regarded as evidence of definitive physiological



improvement or causal intervention efficacy. Rather, they should be interpreted as a preliminary pattern consistent with short-term functional stability and perceived contextual acceptability.

Functional Stability and Adaptation under Structural Constraints

The absence of statistically significant differences should be interpreted in relation to ageing physiology and the design of the present study. Ageing is commonly associated with gradual declines in muscle strength, neuromuscular coordination, aerobic capacity, flexibility, and balance, all of which are important for maintaining functional independence in later life (Izquierdo et al., 2025). Within this context, the absence of group-level mean decline across the Senior Fitness Test indicators over 12 weeks may be viewed as a functionally relevant preliminary finding, particularly because the intervention was implemented in a real-world monastic setting rather than in a controlled exercise environment. The one-group pretest-posttest design did not establish whether the observed pattern differed from what would have occurred without the intervention.

The baseline profile also showed that 50.00% of participants reported chronic health conditions, 56.67% used assistive devices, and 40.00% reported some degree of activity-related limitation. Thus, the observed results were consistent with a preliminary pattern of short-term functional stability, but it did not demonstrate that SADHU prevented decline or produced physiological adaptation. Although all measured indicators showed favourable directional changes at the descriptive level, none met the prespecified threshold for statistical significance. The findings, therefore, justify further evaluation of routine-based movement in monastic settings rather than a claim of intervention efficacy. This interpretation is consistent with the use of functional fitness as an indicator of older adults' capacity to perform daily activities (Tomás et al., 2018). Previous evidence has identified obesity, hypertension, and other social determinants as important health concerns among Buddhist monks (Jeamjitvibool et al., 2022), while frailty-related vulnerability has also been reported among older monks in Thailand (Ratanasiri & Lerttrakarnnon, 2019).

Embedded Recreational Physical Activity within Monastic Routines

A primary contribution of the SADHU Model is its organisation of physical activity as recreational movement embedded within daily monastic life. The model did not introduce conventional exercise as an external requirement. Instead, it reorganised existing monastic routines and temple-based activities into structured opportunities for extremely light to very light intensity movement. In this study, alms-round walking, washing monastic garments, sweeping temple grounds, light temple maintenance, walking meditation, arm-swing walking, and brisk walking were used as routine-based activities that supported functional engagement without separating movement from the structure of monastic life.

The novelty of SADHU, therefore, lies less in creating unfamiliar exercises than in arranging familiar monastic activities into a repeatable movement structure. This is relevant to scientific recreation because the practical question is not simply whether ageing monks can participate in conventional exercise, but whether movement already embedded in temple life can be



organised more systematically without disrupting monastic responsibilities. Social and environmental fit may be relevant to the uptake and maintenance of physical activity among older adults (Zubala et al., 2017). However, the present study showed only that the planned activities were implemented over 12 weeks in participating temples; It did not evaluate long-term maintenance.

The intervention protocol prescribed activities within a Borg 6 - 20 target range of 7 to 9, corresponding to extremely light to very light perceived exertion. This low-demand structure was appropriate to the participants' functional circumstances and the routine-based character of monastic life. It also reduced the need for specialised equipment or substantial changes to daily routines. By relying on existing routines and minimal additional resources, the model may offer a locally adaptable health-promotion approach relevant to sustainable development in rural monastic communities. Exercise interventions have been associated with improvements in physical performance and activities of daily living among the oldest-old and frail older adults, although effects vary according to intervention content, dose, and participant characteristics (Lau et al., 2023). Nevertheless, the present study did not measure physical activity volume, individual adherence, energy expenditure, or long-term training adaptation. The observed trends should therefore not be equated with the effects expected from supervised multicomponent exercise training.

Contextual Legitimacy and Acceptability within Monastic Life

Participant satisfaction was high. The overall satisfaction score was 4.01 ± 0.73 , while perceived benefit received the highest score at 4.23 ± 0.57 . These ratings were interpreted as descriptive feedback on perceived feasibility and contextual acceptability rather than as evidence of physiological effectiveness. They indicated that participants viewed the activities as beneficial, relevant, and compatible with monastic routines. The model's contextual acceptability may partly reflect its compatibility with monastic discipline and established monastic routines. Panyachit (2026) similarly indicates that monks' health behaviours and bodily movement are shaped by the Dhamma-Vinaya and enacted through ordinary monastic activities. This alignment may have reduced the extent to which participation required a separate exercise identity or new institutional routine. The lower relative ratings for daily application and participatory reflection meetings also suggest that future implementation may require greater support from temple leadership and local health networks. This is consistent with work on health promotion among older monks that has emphasised coordination among monks, communities, and health-related actors, although those studies addressed different interventions and outcomes (Akarathanarak & Sukonthasab, 2024).

Mindful Movement and Functional Stability

The SADHU Model provides a Buddhist-compatible interpretation of movement while remaining grounded in sports science. Activities such as walking meditation, alms-round walking, and temple-based movement were understood as forms of mindful movement when they involved bodily awareness, moderation, and rhythm. Mindful movement was used as a contextual rationale for activity design, not as a measured psychological mechanism.



The doctrinal foundation was deliberately narrow. The Satipaṭṭhāna Sutta identifies awareness of walking, standing, sitting, and lying down as part of attention to bodily experience (MN 10), while the Dhammapada presents appamāda as heedful and non-negligent conduct (Dhp 21 - 23). These references were not used as clinical evidence for the outcomes observed in this study. They clarified the compatibility of attentive movement and careful participation with monastic life. A recent systematic review similarly identified Buddhist walking meditation, walking meditation, and mindful walking as health-related practices studied in adults and older adults, while also noting substantial variation in populations, intervention formats, and outcomes (Montalva-Valenzuela et al., 2025). Buddhist ethical thought may offer a broader orientation for health-related conduct, but it does not replace exercise-science evidence or establish a physiological mechanism for the present findings (Bodhiprasiddhinand, 2024).

From a sports and recreation science perspective, the selected activities involved repeated extremely light to very light intensity movement relevant to cardiovascular endurance, mobility, balance, and flexibility. The favourable directional changes observed across the Senior Fitness Test indicators were consistent with the possibility that routine-based movement could be examined further as one approach to supporting functional participation. However, because the study did not include a control group and none of the observed changes met the prespecified threshold for statistical significance, this interpretation remains preliminary. Buddhist principles, therefore, function as contextual grounds for activity design, whereas functional fitness assessment and outcome interpretation remain grounded in sports and exercise science.

Limitations and Future Directions

Several limitations should be considered. The one-group pretest-posttest design limited causal interpretation, and the modest sample size may have reduced the ability to detect small changes. In addition, the intervention period, which lasted 12 weeks, may not have been sufficient to detect measurable physiological adaptation. The findings were specific to rural Thai temple communities and should therefore be interpreted within this context. Future research should examine the SADHU Model using controlled study designs, larger samples, and longer follow-up periods. Further studies should also assess adherence, physical activity volume, frailty status, falls, and daily functional performance to provide a more complete understanding of whether routine-embedded movement contributes to sustained functional health among ageing monks.

Overall, the findings did not demonstrate statistically significant physiological improvement or causal intervention efficacy. They showed that a routine-embedded programme was implemented over 12 weeks among ageing monks and was accompanied by favourable directional changes in health-related functional fitness and high participant satisfaction reflecting perceived feasibility. SADHU should therefore be understood as an empirically informed, context-sensitive model for organising recreational physical activity within monastic routines rather than as evidence of intervention efficacy.

Originality and Body of Knowledge



Figure 4 Context-Integrated Ecological Model of Functional Stability under Monastic Structural Context

As shown in Figure 4, the body of knowledge generated by this study is a context-integrated ecological synthesis in which monastic structural context, comprising the Vinaya, samana-sarupa, daily routines, and behavioural constraints, shapes movement within the conditions of ageing physiology and monastic lifestyle. The figure depicts alms-round walking, temple maintenance tasks, walking meditation, arm-swing walking, and brisk walking as routine-embedded movement practices. At its centre, preliminary functional stability is positioned as a contextually meaningful outcome, represented by the absence of group-level mean decline and favourable directional trends in health-related functional fitness, rather than as evidence of physiological adaptation or causal intervention efficacy.



As reflected in this synthesis, the originality of the SADHU Model lies not in introducing unfamiliar exercises or claiming a new physiological training effect, but in organising ordinary monastic life into a repeatable, context-sensitive structure for Buddhist-based recreational physical activity. It addresses a gap left by monk-focused health initiatives that have mainly emphasised community participation, mental health support, medication-related concerns, or broader health behaviours, while evidence on Buddhist walking meditation and mindful walking remains heterogeneous in populations, formats, and outcomes. The SADHU Model differs from these approaches in three respects. First, it systematically organises existing monastic duties into three routine-based activity categories, namely inherent monastic routines, supportive temple-based activities, and structured movement practices. During the intervention, these activities were delivered at an extremely light to very light intensity within a Borg 6 - 20 RPE target range of 7 to 9, and health-related functional fitness was assessed using the Senior Fitness Test. Second, it incorporates the Vinaya, samana-sarupa, sati, and appamāda as contextual design principles that guide compatibility with monastic conduct, while keeping outcome assessment and interpretation grounded in sports and exercise science rather than treating Buddhist principles as clinical explanations. Third, its contribution does not rest on a claim of intervention efficacy; Instead, it specifies functional stability as a study-specific interpretive framework for understanding favourable directional changes in health-related functional fitness in the absence of statistically significant change during the intervention period. Participant satisfaction and perceived feasibility were assessed separately as descriptive indicators of perceived contextual acceptability. This contribution extends sports and recreation science by conceptualising recreational physical activity as culturally appropriate and institutionally embedded movement for populations whose opportunities for activity are shaped by ethical, religious, and organisational conditions.

Conclusions and Recommendations

The findings did not demonstrate statistically significant physiological improvement or causal intervention efficacy. Rather, they showed that the SADHU Model was implemented over 12 weeks through three activity categories embedded within daily monastic routines: Inherent monastic routines, supportive temple-based activities, and structured movement practices. The implementation was accompanied by favourable directional changes across health-related functional fitness indicators, although none reached the prespecified threshold for statistical significance. Within the study-specific interpretive framework, this pattern was consistent with short-term functional stability rather than evidence that the model prevented decline or produced physiological adaptation. Participant satisfaction was high and was interpreted as descriptive feedback on perceived feasibility and contextual acceptability rather than as evidence of physiological effectiveness. As a contribution to Applied Buddhism, SADHU demonstrates how the Vinaya, samana-sarupa, sati, and appamāda can inform the development of a health-related process model without displacing sports and exercise science as the basis for outcome assessment and interpretation. SADHU should therefore be understood as



an empirically informed, context-sensitive model that organises existing monastic duties, temple-based activities, and structured movement practices into extremely light to very light intensity recreational physical activity compatible with monastic conduct, individual functional capacity, and the ordinary rhythm of temple life. For practice, temples, monastic leaders, community health volunteers, and local health personnel may consider supporting context-appropriate activities such as alms-round walking, light temple maintenance, walking meditation, arm-swing walking, and brisk walking as flexible routine-based movement practices for ageing monks, provided that these remain compatible with monastic conduct and are adapted to individual functional capacity and health limitations. Future research should examine the SADHU Model using controlled study designs, larger samples, and longer follow-up periods, while further assessing adherence, physical activity volume, frailty status, falls, quality of life, and daily functional performance to clarify whether routine-embedded recreational physical activity contributes to sustained functional health among ageing monastic populations.

Acknowledgement

The author expresses sincere gratitude to the venerable monks in Sisaket Province, Thailand, for their participation and cooperation throughout the intervention and assessment process. Appreciation is extended to the monastic leaders and temple authorities for their support and for permitting research activities to be conducted within temple settings. The author gratefully acknowledges financial support from Thailand Science Research and Innovation (TSRI) through Sisaket Rajabhat University, as well as administrative support from the Research and Development Institute, Sisaket Rajabhat University. The author also thanks the expert panel and all individuals who contributed their time, knowledge, and expertise to the expert review and implementation of the SADHU Model.

References

- Akarathanarak, T. & Sukonthasab, S. (2024). Model of Developing Monks for Promoting Health among the Aging through Community Participation. *Pakistan Journal of Life and Social Sciences*, 22(2), 100980-100989. <https://doi.org/10.57239/PJLSS-2024-22.2.00830>.
- Bodhiprasiddhinand, P. (2024). Buddhist Ethics for Improving Health and Well-Being during Pandemics Like COVID-19 with Special References to Modern Scientific Experiments. *Religions*, 15(4), 511. <https://doi.org/10.3390/rel15040511>.
- Borg, G. (1998). Borg's perceived exertion and pain scales. Champaign, United States of America: Human kinetics.
- Chisana, N., Banharak, S., Panpanit, L., Chanaboon, S. & Tipkanjanaraykha, K. (2023). Study of medication use and effects of medication among hospitalized older Buddhist monks: An embedded mixed-method study. *Journal of Advanced Nursing*, 79(9), 3609-3621. <https://doi.org/10.1111/jan.15661>.



- Codrington, S., Yakong, N., Inmueang, K. & Jaroensiripisarn, J. (2025). Factors Predicting Self-Management Behavior among Thai Older Monks with Type-2 Diabetes: A Cross-Sectional Study. *Pacific Rim International Journal of Nursing Research*, 29(1), 184-196. <https://doi.org/10.60099/prijnr.2025.270221>.
- Izquierdo, M., de Souto Barreto, P., Arai, H., Bischoff-Ferrari, H. A., Cadore, E. L., Cesari, M., Chen, L.-K., Coen, P. M., Courneya, K. S., Duque, G., Ferrucci, L., Fielding, R. A., García-Hermoso, A., Gutiérrez-Robledo, L. M., Harridge, S. D. R., Kirk, B., Kritchevsky, S., Landi, F., Lazarus, N., Liu-Ambrose, T., Marzetti, E., Merchant, R. A., Morley, J. E., Pitkälä, K. H., Ramírez-Vélez, R., Rodríguez-Mañas, L., Rolland, Y., Ruiz, J. G., de Asteasu, M. L. S., Villareal, D. T., Waters, D. L., Won, C. W., Vellas, B. & Singh, M. A. F. (2025). Global consensus on optimal exercise recommendations for enhancing healthy longevity in older adults (ICFSR). *The Journal of nutrition, health and aging*, 29(1), 100401. <https://doi.org/10.1016/j.jnha.2024.100401>.
- Jeamjitvibool, T., Tankumpuan, T., Lukkahatai, N. & Davidson, P. M. (2022). Noncommunicable diseases and social determinants of health in Buddhist monks: An integrative review. *Research in Nursing & Health*, 45(2), 249-260. <https://doi.org/10.1002/nur.22215>.
- Ko-amornsup, W., Siriussawakul, A., Aosangdeeku, K., Preedachitkul, R., Srinonprasert, V., Somnuke, P., Muangpaisan, W., Petchthai, P. & Kitnarong, N. (2024). Health Survey of Monks Residing in Urban Areas: The Bangkok Noi Model. *Siriraj Medical Journal*, 76(11), 746-757. <https://doi.org/10.33192/smj.v76i11.269296>.
- Langgapin, S., Boonchieng, W., Chautrakarn, S., Maneeton, N. & Senawan, S. (2024). Development of a Monk-Led Elderly Mental Health Counseling Program in Thai Buddhist Communities. *Religions*, 15(8), 998. <https://doi.org/10.3390/rel15080998>.
- Lau, L. K., Tou, N. X., Jabbar, K. A., Tang, J. Y., Gao, J., Ding, Y. Y. & Ng, Y. S. (2023). Effects of Exercise Interventions on Physical Performance and Activities of Daily Living in Oldest-Old and Frail Older Adults: A Review of the Literature. *American Journal of Physical Medicine & Rehabilitation*, 102(10), 939-949. <https://doi.org/10.1097/PHM.0000000000002246>.
- Montalva-Valenzuela, F., Guzmán-Muñoz, E., Ferrari, G., Adsuar, J. C., Ruiz, N. E. & Castillo-Paredes, A. (2025). Effects of Buddhist Walking Meditation, Walking Meditation or Mindful Walking on the Health of Adults and Older Adults: A Systematic Review. *Psychiatry International*, 6(4), 122. <https://doi.org/10.3390/psychiatryint6040122>.
- Panyachit, S. (2026). Barefoot Health: The Healthy Lifestyle Path of Monks in Thailand. *Journal of Population and Social Studies (JPSS)*, 34, 236-252.
- Park, C. & Kim, K. (2025). Old Age, Sickness & Death: Buddhist Monastic Retirement & Eldercare Within South Korea's Super-Aged Society. *Religions*, 16(11), 1412. <https://doi.org/10.3390/rel16111412>.
- Prapassorakul, P. & Yotsombut, K. (2025). Potentially inappropriate medications among outpatient elderly Buddhist monks in Thailand: A comparison of 2023 Beers Criteria, STOPP Criteria Version 3, and 2024 PIM-BHIKKHU Criteria. *Journal of Applied Pharmaceutical Science*, 15(8), 034-042. <https://doi.org/10.7324/JAPS.2025.237301>.



- Ratanasiri, T. & Lertrakarnnon, P. (2019). Frailty and associated factors of elderly Buddhist monks in Chiang Mai Province, Thailand. *Chiang Mai Medical Journal*, 58(4), 211-221.
- Rikli, R. E. & Jones, C. J. (2013). Development and Validation of Criterion-Referenced Clinically Relevant Fitness Standards for Maintaining Physical Independence in Later Years. *The Gerontologist*, 53(2), 255-267. <https://doi.org/10.1093/geront/gns071>.
- Tomás, M. T., Galán-Mercant, A., Carnero, E. A. & Fernandes, B. (2018). Functional Capacity and Levels of Physical Activity in Aging: A 3-Year Follow-up. *Frontiers in Medicine*, 4, 244. <https://doi.org/10.3389/fmed.2017.00244>.
- Zubala, A., MacGillivray, S., Frost, H., Kroll, T., Skelton, D. A., Gavine, A., Gray, N. M., Toma, M. & Morris, J. (2017). Promotion of physical activity interventions for community dwelling older adults: A systematic review of reviews. *PLoS ONE*, 12(7), e0180902. <https://doi.org/10.1371/journal.pone.0180902>.