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Assessing the construct validity of a 36-item multidimensional life satisfaction assessment - a novel tool for measuring life satisfaction among older adults in Thailand

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Abstract

Background The assessment of life satisfaction is influenced by cultural factors, making it important to consider the unique cultural backgrounds of individuals. However, there has been a lack of assessment tools specifically designed for evaluating life satisfaction in Thai older adults based on their own cultural context. The Multidimensional Life-Satisfaction Assessment (MLSA) was developed to address this gap, integrating well-recognized concepts of the Sufficiency Economy within Thai social values to expand more on the social and environmental aspects. This study aimed to develop and preliminarily test the construct validity of the MLSA.

Methods A research and development process was employed to generate relevant items for the MLSA. The final version of the MLSA consisted of 36 items, encompassing nine dimensions: Zest, Resolution, Fortitude, Congruence between desired and achieved goals, Positive self-concept, Sense of Control, Mood Tone, Forgiveness, and Sufficiency Economy. The scale was tested with 600 mentally healthy Thai older adults to evaluate model fitness, convergent and discriminant validity. Concurrent validity was assessed using the Rosenberg self-esteem scale (RSES) and the EuroQoL-5-dimension (EQ5D). A two-week retest analysis assessed the scale's stability over time.

Results The 36-item MLSA demonstrated acceptable internal consistency for each dimension. The nine-factor solution model exhibited adequate fit statistics. While the scale demonstrated adequate convergent validity, discriminant validity was not initially established due to overlapping dimensions. However, discriminant validity was established after modelling a second-order factor. Significant correlations between MLSA scores and RSES and EQ5D were observed, indicating concurrent validity. The MLSA also demonstrated satisfactory test-retest reliability.

Conclusion The MLSA shows promise as a new tool with an integrated new concept for assessing life satisfaction in older adults. Using a total score, MLSA can be used as a total score to represent overall life satisfaction or can be used as a separate dimension. However, utilizing some dimensions should be careful as they share some variance

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with other dimensions. Given that the study was specifically conducted with mentally healthy older adults, further replication studies across different settings and cultures are encouraged to confirm the construct validity of the MLSA definitively.

Clinical trial registration number N/A.

Keywords Sufficiency economy theory, Successful aging, Older adult, Thai, Quality of life, Neugarten

Background

Life satisfaction (LS) is a multifaceted concept that refers to one's overall evaluation of the quality of life, guided by personal and cultural standards that evolve with age and societal influences [1–5]. The factors driving LS and their relative importance can change over the life course.

In younger populations, including children, adolescents, and young adults, LS is often associated with family cohesion, peer acceptance, academic achievement, emerging independence, self-esteem, and a growing sense of autonomy. For adolescents and young adults, especially, LS is influenced by social belonging, explorations of identity, success in education or early career, and the ability to pursue interests and foster friendships. Positive mental health, purpose, and supportive environments are essential at these stages. Notably, the development of self-image and the pursuit of achievements or experiences play prominent roles in shaping LS during youth and adulthood [1–4].

Among working-age and middle-aged adults, LS is often associated with fulfilling social roles, career advancement and stability, marital or partner relationships, parenthood, financial security, and progress toward long-term goals. Life circumstances and transitions, such as starting a family, changing jobs, or experiencing setbacks, can both challenge and enhance LS.

The theoretical underpinnings of LS across the lifespan include frameworks such as the Selective Optimization with Compensation (SOC) theory, which posits that individuals maintain LS by focusing on strengths, adapting to age-related losses, and seeking meaningful activities throughout life. The Socioemotional Selectivity Theory further posits that as people age, they increasingly value emotionally meaningful relationships and experiences, while younger people typically seek novelty, exploration, and achievement.

The understanding and assessment of LS are further shaped by culture and religion. In Western individualist societies, LS is primarily driven by personal goals, autonomy, and self-expression, and closely linked to self-esteem and achievement [6]. In contrast, Asian and collectivist cultures emphasize family and community roles, social harmony, and meaningful relationships [7]. For example, in Thailand, LS is also shaped by Buddhist values (emphasizing kindness, forgiveness, humility), traditional respect for the monarchy, and collective well-being. Across all cultures, religion often informs attitudes about gratitude, tolerance, and the pursuit of a meaningful existence [7].

While certain aspects of LS—such as self-concept, social connection, and a positive view of life—may be universal, their relative importance and expression shift with both culture and stage of life. The tools used to measure LS, such as the Satisfaction with Life Scale [3], often focus on psychological or individualistic dimensions and may not adequately address all these nuances. With rising global life expectancy, the proportion of older adults is steadily increasing [8]. Older adults face unique challenges—including physical decline (e.g., chronic illness, disability), psychological concerns (e.g., depression, loss of meaning), and social transitions (e.g., loneliness, altered family roles, loss of societal status) [9]. These challenges can lead to a sense of diminished self-worth or becoming a "burden" to family, potentially lowering LS, especially for those who previously held significant social roles [10]. Research is mixed: some studies report that LS declines with age due to these factors [11, 12], while others show that aging can bring greater wisdom, life experience, more stable and altruistic social engagement, and resilience, all of which can support LS [13].

Successful aging is frequently defined as a multidimensional achievement: active engagement in life, low burden of disease/disability, ongoing cognitive and physical abilities, and a sense of spirituality or meaning [14]. Both SOC and Socioemotional Selectivity Theory suggest that older adults may compensate for losses by focusing on emotionally and socially meaningful pursuits, maintaining or even increasing LS in later life.

In addition to established frameworks such as Successful Aging, SOC, and SST, gerotranscendence theory offers valuable insights into later life and life satisfaction. Proposed by Lars Tornstam, this concept highlights a natural shift in older adults from materialistic, self-focused views to increased existential reflection, deeper interpersonal connections, and a greater acceptance of life's spiritual and finite nature [15]. This shift brings more inner peace, less concern with social norms, and greater life satisfaction. Studies show that those high in gerotranscendence experience greater life satisfaction and well-being [16]. The theory also aligns with cultural and spiritual traditions in societies like Thailand, particularly Buddhist teachings on transcendence and

impermanence, offering a more holistic perspective on late-life fulfillment [17].

LS in older adults is highly shaped by cultural context. In Thailand, Buddhist values, respect for elders, and collective family systems provide social frameworks that buffer the negative effects of aging. Integral to modern Thai society is also the influence of King Rama IX's Sufficiency Economy theory, which encourages moderation, reasonableness, and self-immunity as paths to well-being [18, 19]. This philosophy, emphasizing balance and resilience, has been successfully integrated into interventions for older adults to improve mental and overall health [20, 18]. The practice of moderation discourages extremes in lifestyle, reasonableness supports prudent decision-making, and self-immunity fosters resilience to change and stress, paralleling concepts of psychological well-being found in Western literature but articulated through a uniquely Thai lens.

In addition to these cultural values, recent research suggests that the influence of religious practices—such as meditation and adherence to the Buddhist Five Precepts—also varies across generations in Thailand. Older adults tend to adopt these Buddhist practices more consistently and benefit from their positive effects to a greater extent. A comparative study of Thai adults found that regular meditation combined with adherence to the Five Precepts was associated with significantly lower symptoms of depression among older individuals, highlighting a stronger protective effect of religious involvement within this age group. In contrast, while younger adults may also engage in these practices, the reduction in depression was not as pronounced. For younger adults, it was primarily the practice of the Five Precepts—rather than their combination with meditation—that mediated the relationship between stress and depression, suggesting that religious practices may play a different, and perhaps less central, role in their daily life satisfaction and well-being.

These findings reinforce the importance of considering cultural and generational influences when examining LS in older adults. The life satisfaction of older Thai adults is truly multidimensional, encompassing physical health, social and family relationships, socioeconomic stability, mental health, and environmental factors [21]. Given the diversity in definitions and influences across cultures and ages, it is essential that LS assessment tools are flexible enough to accommodate both universal and culturally specific domains.

Most life satisfaction (LS) instruments, such as the Satisfaction with Life Scale (SWLS) [3] and Life Satisfaction Index A [5], were developed in Western, individualistic contexts, prioritizing personal achievement, autonomy, and internal standards.

Although widely used, these tools often overlook culturally specific dimensions of well-being, particularly in collectivist societies like Thailand. Elements such as family relationships, community belonging, spiritual beliefs, and values like forgiveness and sufficiency—central to Thai life satisfaction—are not sufficiently addressed by Western-oriented scales.

Recent cross-cultural research highlights the limited ecological validity and potential measurement bias when applying instruments like the SWLS outside Western societies [22]. In Thailand, life satisfaction is closely linked with Buddhist principles, intergenerational harmony, and King Rama IX's philosophy of the Sufficiency Economy. These factors, absent from most existing LS tools, are critical for accurately assessing well-being in this context.

Thailand's distinctive cultural landscape—shaped by the influence of Theravāda Buddhism and reverence for the monarchy—sets its notion of life satisfaction apart from neighboring countries, which tend to be more influenced by Confucian values or extended kinship structures.

Thailand's distinctive cultural values, particularly among older adults, include practices such as moderation and resilience, along with emotionally grounded principles. ให้อภัย (forgiveness) reflects a compassionate disposition toward releasing resentment and extending understanding, even in the face of interpersonal conflict or disappointment. *Mai pen rai* (ไม่เป็นไร), commonly translated as "never mind" or "it's okay," embodies graceful acceptance and emotional flexibility in response to setbacks and impermanence. These qualities are deeply embedded in Thailand's moral and spiritual landscape, reinforced by community interconnectedness, and contribute meaningfully to the lived experience of well-being in later life [23].

These qualities are embedded in Thailand's moral and spiritual landscape, reinforced by community interconnectedness, and contribute meaningfully to the lived experience of well-being in later life. Given these distinct cultural features, there remains a need for a multidimensional, culturally sensitive LS assessment tool that reflects the lived experiences and values of older adults in Thailand. Such a tool should integrate psychological domains with dimensions like social and environmental engagement, resilience, moderation, and the principles of the Sufficiency Economy, providing a holistic and accurate assessment of life satisfaction. This study aimed to develop and validate a comprehensive questionnaire to measure life satisfaction in older Thai adults, incorporating multidimensional and culturally relevant constructs—particularly those drawn from Thai culture and the Sufficiency Economy—and rigorously testing its validity (Fig. 1).

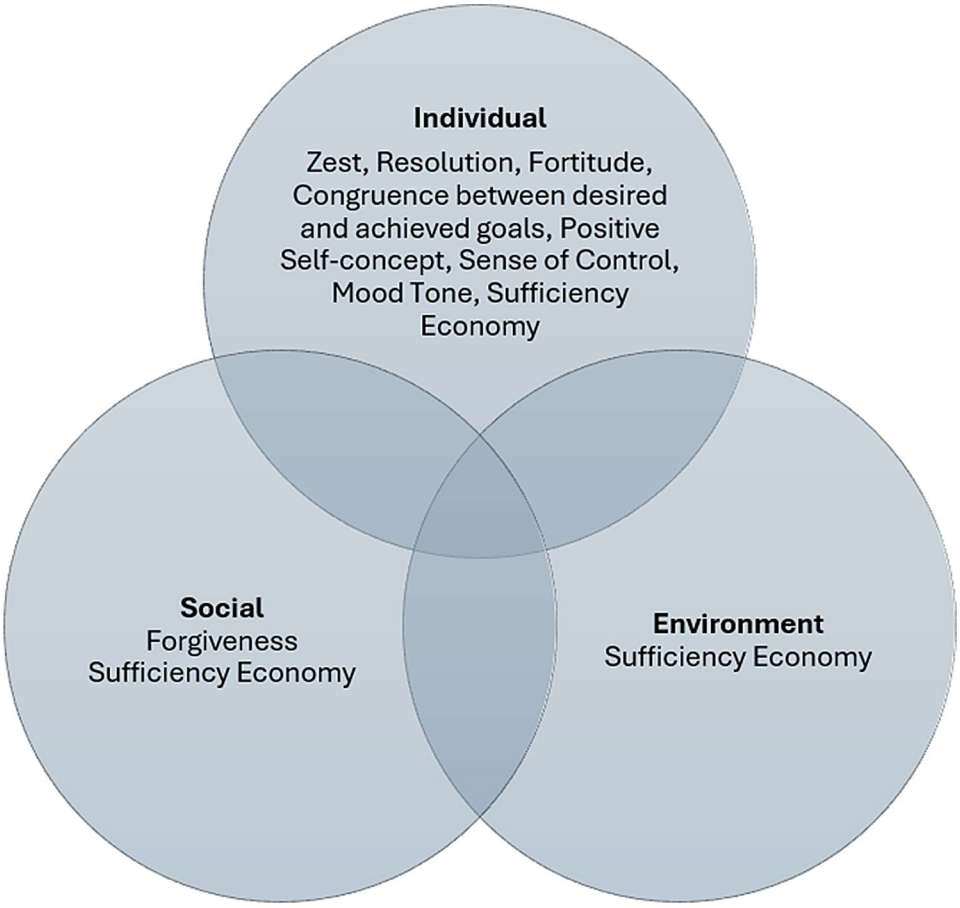

Fig. 1 The new concept of life satisfaction incorporating the sufficiency economy

Materials and methods

This study design used a two-stage approach: (1) research and development (R&D) for a new measurement. As illustrated in the flow diagram, the research design for the development of the new LS scale is described as follows (Fig. 2), and (2) assessment for the construct validity of the new scale using structural equation modeling (confirmatory factor analysis).

Step 1: research and development (R & D)

Literature review

Literature review of national and international academic studies relevant to concepts and theories regarding aging, life satisfaction, well-being, successful aging, quality of life, culture, individualism, collectivism, morality, virtues, and strengths. The databases include MEDLINE (using PubMed), PsycINFO, Web of Science, Scopus, Google Scholar, ERIC (Education Resources Information Center), and Social Sciences Citation Index (SSCI).

Expert discussion on the definition and domains of a new life satisfaction assessment

In developing a new scale of life satisfaction tailored explicitly for the elderly, experts should be selected based on their specialized knowledge and experience in gerontology, psychology, social work, and related fields. The expert team included a geriatric psychiatrist, a general psychiatrist who had over 10 years of experience working with the older population, psychologists, social workers, physicians, and nurses who specialize in geriatrics, researchers with a background in research methodology, scale development, and psychometrics, and scholars specializing in sociology and gerontology who guided cultural, social, and environmental impacts.

The investigators convened and conducted meetings at Suansaranrom Hospital in Surat Thani, Thailand. A structured format was employed, with the agenda focused on elucidating the objectives of developing a new, updated, that encompasses individual, social, community, cultural, and environmental dimensions. Experts were encouraged to propose and discuss their perspectives freely. The discussions encompassed a broad range of content,

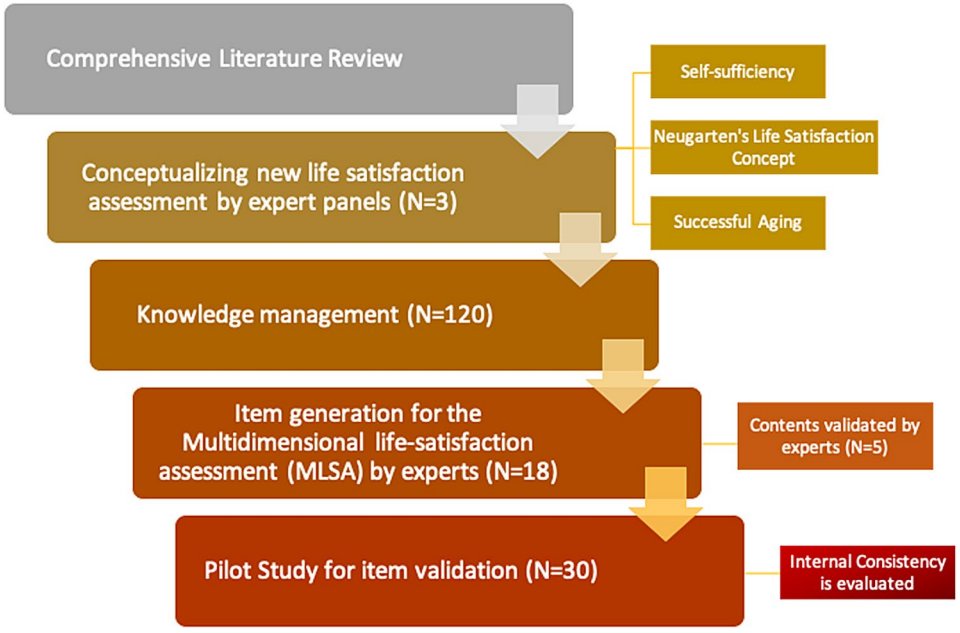

Fig. 2 Flow diagram summarizes the R & D

addressing both national and international perspectives and spanning various cultures and religions.

During the discussion, there was general agreement to include the well-known concept of Neugarten in the new scale. However, some disagreed about incorporating other aspects of life satisfaction beyond Neugarten's concept, which was relevant to Thai culture but could also apply to other cultures. Some experts suggested expanding the scale to encompass not only individual-level factors, as proposed by Neugarten, but also other areas of satisfaction. Additionally, the sufficiency economy, a well-known philosophy for Thai people, was proposed to be included in the scale to highlight its impact on social and environmental aspects. There was consensus that this concept is grounded in morality and wisdom when dealing with life's problems. Practicing the sufficiency economy concept should lead to satisfaction, mental well-being, and overall life satisfaction.

A draft of a novel life satisfaction assessment for older adults has been formulated, encompassing three key aspects: Neugarten's life satisfaction concept [24], successful aging [5, 14], and Sufficiency Economy theory [19].

A nationwide focus group discussion among older people

The investigators invited 120 older adult participants from four regions in Thailand—northern, central, northeastern, and southern—selecting 30 people from each region. These participants were divided into 3–4 groups per region, with 8–12 participants per group. They participated in face-to-face structured interviews focused on the life satisfaction draft for preliminary knowledge management. The focus group discussion guides used in your study were developed for this study. All participants were aged 60 years or older. The mean age (SD) was 68.64 (6.7). They had no psychiatric illnesses and were recruited from different occupations and social statuses. The interview was conducted by research assistants over a period of one hour. The structured interview consisted of introductory questions, in-depth discussion questions, and additional follow-up questions. The originally drafted dimensions of the scale included (1) Mood tone, (2) Enjoyment, (3) Resolution, (4) Fortitude, (5) Congruence between desired and achieved goals, (6) Positive self-concept, (7) Giving up authority, (8) Reconciliation with others, (9) Self-sufficiency (see additional file).

Generating items for the multidimensional Life-Satisfaction assessment (MLSA)

Hundreds of items were extracted from the focus group interview and discussion results to create new life-satisfaction items. Then, experts who were qualified for this research were invited.

They included a gerontologist, two psychologists, a sociologist, a geriatrician, three psychiatric nurses, an occupational therapist, a public health expert, a social worker, a representative of the financial sector, a statistician and psychometrician, a cultural anthropologist, a senior volunteer from an organization for social development (brain bank), three older adults from diverse religious backgrounds (Table S1 of the Supplementary file).

A total of 18 academic experts from diverse disciplines were recruited to evaluate, discuss, review, and revise the items in accordance with the conceptual framework. The

majority were female (77.8%), aged between 45 and 59, with a mean age of 52.33 years (SD = 4.7).The final version of the MLSA, consisting of 9 dimensions, namely Zest, Resolution, Fortitude, Congruence between desired and achieved goals, Positive Self-concept, Sense of Control, Mood Tone, Forgiveness, and Sufficiency Economy, was established. The operational definitions of each dimension and their respective items are shown in Table S2 of the Supplementary file. This new version of LSA, the multidimensional life satisfaction assessment (MLSA), comprised 55 items with 4 Likert responses.

Five experts examined the MLSA's content Validity Index (CVI), including two psychiatrists and three academics specializing in geriatric nursing. The Content Validity for Scale (S-CVI) yielded a value of 0.94, indicating an acceptable index.

Testing among older adults

The preliminary study tested 30 older adult volunteers, with an average age of 67, and 70% were female. On average, our sample group scored 76.7%. Additionally, our analysis showed that the 55-item MLSA yielded Cronbach's alpha of 0.898.

Item reduction for the final version of MLSA

A principal component analysis with 550 participants was applied to reduce the number of items and make the tool more economical and practical. The items with the four highest loadings from each dimension were kept. As a result, the tool was a final 36-item MLSA (supplement file).

Step 2: Testing for the construct validity

The 36-item MLSA was analyzed using a confirmatory factor analysis study of 600 older adult participants. Model fit statistics and model comparison were conducted to find the best-fit model for the data. The first-order nine-factor solution model was hypothesized to fit the data adequately.

Additional instruments

Rosenberg self-esteem scale (RSES) RSES is a self-rating questionnaire comprising 10 items that assess global self-worth by examining positive and negative feelings toward oneself. The Thai version of the RSES has demonstrated excellent validity and reliability. In the present study, Cronbach's alpha coefficient was calculated to be 0.88, indicating high internal consistency.

EuroQol-5 dimensions (EQ-5D) EQ-5D is a tool developed by the EuroQol group to evaluate health-related quality of life. It encompasses five dimensions of health: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. The utility index of the EQ-5D ranges from less than 0 (indicating a health state worse than death) to 1 (representing perfect health). The Thai translation of this questionnaire has exhibited strong reliability and validity in previous studies.

Statistical analysis

Descriptive statistical methods, which include Mean, Standard deviation, and Frequency (%), were employed to evaluate the data. Cronbach's alpha was used to investigate internal consistency. Construct reliability and validity were calculated. Construct reliability (CR) is a form of reliability used to judge the consistency of results across items on the same test. It determines whether the items measuring a construct are similar in their scores. The recommended cut-off value is 0.70 for both Cronbach's Alpha and Composite Reliability. The stability of the MLSA was determined by test-retest reliability using intraclass correlation.

Convergent validity is the extent to which the construct converges in order to explain the variance of its indicators. The convergent validity of the MLSA was examined by structural equation modelling using CR and Average Variance Extracted (AVE). The AVE is defined as the grand mean value of the squared loadings of the indicators associated with the construct (i.e., the sum of the squared loadings divided by the number of indicators). The minimum acceptable AVE is 0.50. For discriminant validity, the Fornell and Larcker Criterion was adopted [18], which includes AVE and Maximum Shared Variance (MSV). Maximum Shared Variance (MSV) refers to the maximum amount of shared variance that can exist between two constructs in a CFA model. It measures the extent to which the indicators of two constructs overlap or correlate due to their shared variance. High MSV values indicate a potential problem with discriminant validity, suggesting that the two constructs may not be distinct enough. The maximum squared correlation between any two constructs in the model is used to calculate MSV. If the MSV value is higher than the constructs' average variance extracted (AVE), it indicates potential issues with discriminant validity. In addition, the Heterotrait-Monotrait (HTMT) Ratio, proposed by Henseler and colleagues [25], was also used to determine discriminant validity. The HTMT Ratio was obtained by comparing the correlation between different dimensions to the correlations within the same construct. A value of the HTMT Ratio less than 0.85 indicates discriminant validity. The tables presenting the CR, AVE, MSV, and HTMT Ratio results were generated using the AMOS plugin developed by Gaskin and colleagues [26]. Confirmatory factor analysis was performed using Mplus 8.8. Item responses were calculated to show whether they had acceptable skewness and kurtosis ($< \pm 2$). Robust weighted least square

means and variance adjusted (WLSMV) were employed for parameter estimators as data were ordinals [27]. To indicate a good fit of the model to the data, the following fit statistics were used; Comparative Fit Index (CFI), Tucker-Lewis Index (TLI) >0.95, a standardized root mean square residual (SRMR), and a root-mean-square error of approximation (RMSEA) ≤ 0.6 [28], and the ratio χ^2/DF < 3. Criterion validity was measured by Spearman's correlation between the MLSA dimensions, Rosenberg's self-esteem total score, and the Eq. 5D index score.

Results

Among 600 participants, 74.7 were female. The mean age of the respondents was 69.41 (SD = 6.67) (min = 60, max = 91). The average time for completing the 36-MLSA was 7.5 min. Regarding item characteristics, the item content and item descriptive statistics are shown in Table 1. The mean of each item ranged between 3.11 and 3.67, and the standard deviation between 0.467 and 0.707. Skewness values ranged from 0.259 to -0.953, and kurtosis values ranged from – 0.069 to -1.833 (Table S2 of the Supplementary file).

Table 1 shows each dimension's range, standard deviation, and Cronbach's alphas. All dimensions' internal consistency values were greater than 0.70, indicating acceptable reliability. Test-retest reliability between time 1 and time 2 was calculated by intraclass correlation.

Confirmatory factor analysis of the 36-MLSA revealed a multidimensional structure, with four first-order domains—Zest, Resolution, Fortitude, and Congruence—loading onto a single second-order factor named Adaptive Vitality. This higher-order factor reflects core strengths central to later-life well-being, such as engagement, resilience, and relational harmony, with robust loadings observed across Zest (0.622–0.856), Resolution (0.741–0.867), Fortitude (0.722–0.842), and Congruence (0.783–0.841). Five additional first-order domains—Positive Self-Concept, Sense of Control, Mood Tone, Forgiveness, and Sufficiency Economy—emerged as independent contributors to life satisfaction (factor loadings: 0.632–0.900). These results support a hierarchical model in which Adaptive Vitality is complemented by distinct domains, together shaping multidimensional life satisfaction in aging (Table 2).

Model comparison and model fitness

Regarding the model fitness, the first order 9-solution model was the model that was shown to be the best fitted to the data. The fit statistics were shown as follows; Chi-Square = 1362.731, *df* = 558, *p* < .001, The ratio χ^2/DF was 2.442, CFI = 0.981, TFI = 0.981, RMSEA = 0.049(90%CI 0.046, 0.052), SRMR = 0.041 (Fig. 3).

The unidimensional model yielded the following fit statistics; Chi-Square = 2977.457, *df* = 594, *p* < .001, The ratio χ^2/DF was 5.102, CFI = 0.942, TFI = 0.939, RMSEA = 0.082(90%CI 0.079, 0.085), SRMR = 0.067.

While the bifactor model yielded the following fit statistics; Chi-Square = 1768.270, *df* = 558, *p* < .001, The ratio χ^2/DF was 3.168, CFI = 0.971, TFI = 0.967, RMSEA = 0.060(90%CI 0.057, 0.063), SRMR = 0.052.

All convergent and discriminant validity tests had CR > 0.7 and CR > AVE, indicating convergent validity. However, three dimensions had AVE > 0.50, while the others had AVE lower than 0.5.

Concerning the criteria for discriminant validity, the AVE was not higher than MSV. Therefore, discriminant validity was not established (Table 3).

According to the HTMT Ratio, three values larger than 0.85 indicate discriminant validity. F3 and F4 are statistically indistinguishable, F3 and F2 are nearly indistinguishable, and F2 and F1 are nearly indistinguishable (Table 4).

Post-hoc analysis of alternative models

We further conducted post-hoc testing of alternative models to help identify the best-fitting model, as the hypothesized 9-factor model was not confirmed.

Table 1 Mean, standard deviation, and cronbach's alpha of each dimension of the 36-item MLSA, and intraclass correlation (ICC) coefficients between time 1 and time 2

	Min-Max		Mean(SD)		Cronbach's alpha		ICC	*p*-value
Dimensions	**Time 1**	**Time 2**	**Time 1**	**Time 2**	**Time 1**	**Time 2**		
1.Zest	11–16	11–16	14.53(1.48)	14.53(1.48)	0.726	0.801	0.311	< 0.001
2.Resolution	9–16	9–16	14.13(1.59)	14.13(1.59)	0.767	0.803	0.458	< 0.001
3.Fortitude	8–16	10–16	13.94(1.66)	13.88(1.62)	0.766	0.774	0.392	< 0.001
4.Congruence between desired and achieved goals	10–16	10–16	14.19(1.58)	14.05(1.66)	0.781	0.810	0.384	< 0.001
5.Positive Self-concept	8–16	7–16	13.71(1.76)	13.58(1.91)	0.769	0.820	0.285	0.002
6.Sense of Control	9–16	8–16	12.95(1.80)	12.90(2.00)	0.757	0.809	0.407	< 0.001
7.Mood Tone	4–16	4–16	13.26(1.92)	13.11(2.05)	0.846	0.891	0.422	< 0.001
8.Forgiveness	9–16	11–16	13.97(1.69)	13.84(1.71)	0.843	0.863	0.357	< 0.001
9.Sufficiency Economy	10–16	9–16	14.15(1.70)	14.08(1.79)	0.838	0.887	0.284	0.002

SD = standard deviation, ICC = Intraclass Correlation coefficients

Table 2 Factor loadings and the structure of 36-MLSA

	Item content	Second Order (Adaptive vitality)	First Order					Dimension
1	I enjoy being surrounded by my children, siblings, and relatives.	**0.622**						Zest
2	I am content with the life I am building for the future.	**0.773**						
3	I can seek happiness as I desire without causing trouble for others.	**0.719**						
4	I have participated in joyful activities with others.	**0.856**						
5	I accept that birth, aging, sickness, and death are natural parts of life.		**0.867**					Resolution
6	Even when I face difficulties, I am satisfied with the outcomes in my life.		**0.781**					
7	I am pleased that I can manage challenging health behaviors.		**0.761**					
8	I find joy in helping those around me who are in trouble.		**0.741**					
9	I am content with my savings, ensuring my life continues without hardship.			**0.842**				Fortitude
10	I am always ready to fight, even when facing difficulties or uncertainties.			**0.808**				
11	I accept the physical decline that comes with age. When I feel uneasy,			**0.722**				
12	I have something to hold onto for support.			**0.725**				
13	I receive care and attention from those around me, which helps prevent me from feeling lonely.				**0.808**			Congruence
14	Even if we don't live together, I find contentment in our visits with relatives.				**0.783**			
15	I am pleased when my children and loved ones succeed in their own ways.				**0.841**			
16	I am grateful to be respected by my children, even though I may not be able to do much now.				**0.794**			
17	I can live independently without relying on others.				0.872			Positive Self-Concept
18	I care for my health to ensure I am not a burden				0.714			
19	I embrace new experiences and believe that age is not an obstacle.				0.750			
20	I have achieved success in various aspects of my life.				0.786			
21	I can let go of different roles without worrying.					0.762		Sense of Control
22	When necessary, I am willing to ask for help from others.					0.737		
23	I accept others' behavior, even if it doesn't meet my expectations.					0.632		
24	I can cope if family members or colleagues choose not to consult me about their problems.					0.864		
25	I strive to control inappropriate words when faced with unpleasant situations.						0.803	Mood tone
26	I manage my emotions across all scenarios						0.895	
27	I have healthy ways to deal with anger.						0.787	
28.	I consistently feel relaxed, regardless of the situation.						0.854	
29.	I find satisfaction in doing good for others.							0.866	Forgiveness
30.	I take pleasure in celebrating the successes of others.							0.849	
31	I always share kindness with others							0.849	
32	I can forgive others even when I feel uneasy.							0.877	
33	I spend reasonably on my needs without hardship,								0.756	Sufficiency Economy
34	I live a modest, sufficient life for my needs.								0.900	
35	I carefully consider my actions.								0.877	
36	I consistently planned my spending and savings.								0.876	

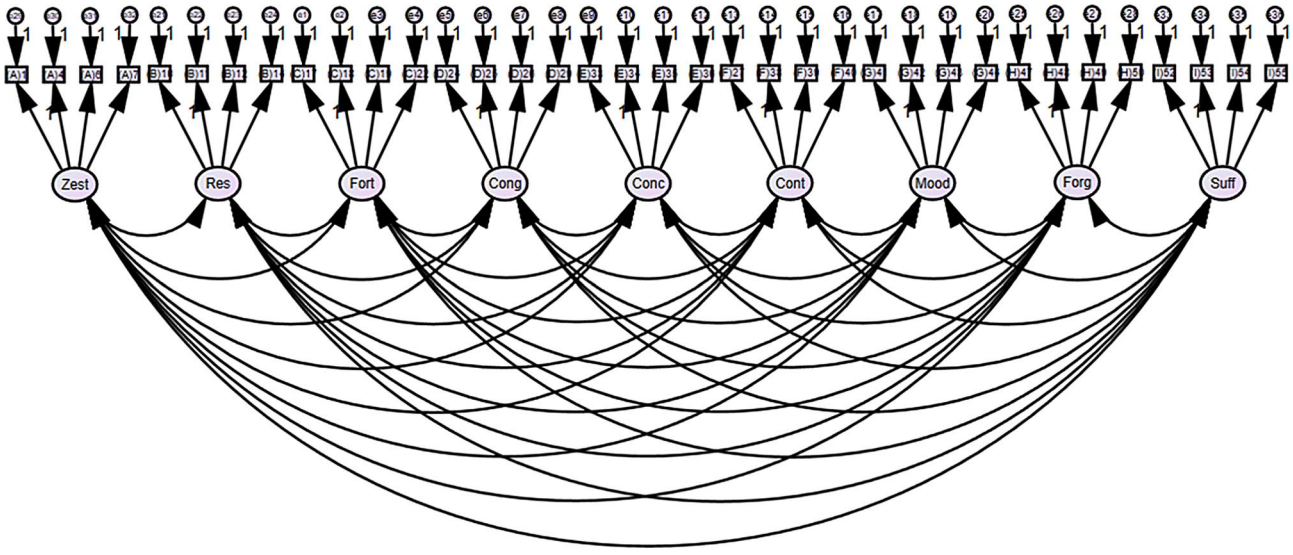

Fig. 3 The first order 9-factor solution model of the 36-MLSA

As recommended by Henseler and colleagues [25], the highly correlated construct can be combined into one factor. We, therefore, merged F1(Zest) to F4 (Congruence) as one factor by making it the second-order factor (Fig. 4).

This has improved the MLSA's discriminant validity. Although there were still some problems with the Fornell and Larcker Criterion, HTMT seems to support its discriminant validity (Table S5 and S6 of the Supplementary file).

The 6-solution model with the second order factor yielded the following fit statistics; Chi-Square = 1502.099, $df = 575$, $p < .001$, The ratio χ^2/DF was 2.612, CFI = 0.978, TFI = 0.975, RMSEA = 0.052(90%CI 0.049, 0.055), SRMR = 0.045.

Concurrent validity analyses involving the MLSA, EQ5D, and Rosenberg Self-Esteem (RSES) scores revealed the following correlation coefficients: The total score of the MLSA exhibited a significant positive correlation with the RSES score ($r = .366$, $p < .001$), indicating a moderate association. However, the total score of the MLSA demonstrated a weak positive correlation with the EQ5D index ($r = .098$, $p = .017$). When examining the relationship between self-esteem and the dimensions of the MLSA, it was found that self-esteem scores were significantly associated with all dimensions. Specifically, positive self-concept and mood tone dimensions of the MLSA exhibited significant correlations with self-esteem (see Table 5).

Discussion

This study aimed to develop a scale for assessing life satisfaction that integrates both Western and Thai cultural perspectives, specifically addressing theoretical gaps and cultural requirements identified in the literature. Life satisfaction among older adults has been discussed in terms of frameworks such as Neugarten's multidimensional model [8], Successful Aging, Selective Optimization with Compensation (SOC), Socioemotional Selectivity Theory (SST), and more recently, gerotranscendence. These models highlight the dynamic nature of life satisfaction, emphasizing adaptation, meaningful social engagement, emotional well-being, and existential reflection as central to well-being in later life. Our findings contribute to this body of work by proposing that a nuanced, culturally contextualized measurement is not only feasible but also necessary.

Building on Neugarten's foundational concept with five dimensions, the newly developed Multidimensional Life Satisfaction Assessment (MLSA) among Thai older adults includes four additional dimensions: mood tone, sense of control, forgiveness, and sufficiency economy. These additions reflect both Western-derived constructs—such as mood tone and sense of control identified in aging and life satisfaction research—and Thai-specific domains, such as forgiveness and the sufficiency economy, which closely align with the values of compassion, moderation, and resilience found in Thai culture and Buddhism (also resonant with gerotranscendence). This multidimensional model embraces the complexity recognized in SOC and SST, where both adaptation to life changes and shifts in socioemotional goals shape subjective well-being.

Our psychometric analysis indicated the 36-item MLSA demonstrates good internal consistency and significant test-retest reliability. The initially hypothesized first-order nine-factor solution provided an adequate fit to the data; however, the hierarchical factor model—with

Table 3 Validity assessment illustrating by construct reliability (CR), average variance extracted (AVE), and maximum shared variance (MSV)

	CR	AVE	MSV	F3	F4	F5	F6	F7	F2	F8	F1	F9
F3	0.766	0.452	0.855	**0.673**								
F4	0.779	0.469	0.763	0.874***	**0.685**							
F5	0.766	0.451	0.653	0.751***	0.747***	**0.671**						
F6	0.759	0.441	0.653	0.780***	0.739***	0.808***	**0.664**					
F7	0.846	0.580	0.626	0.625***	0.637***	0.777***	0.785***	**0.761**				
F2	0.769	0.455	0.855	0.925***	0.756***	0.710***	0.709***	0.571***	**0.675**			
F8	0.844	0.574	0.633	0.796***	0.775***	0.771***	0.795***	0.791***	0.755***	**0.758**		
F1	0.727	0.403	0.816	0.813***	0.788***	0.700***	0.579***	0.532***	0.904***	0.705***	**0.634**	
F9	0.841	0.570	0.607	0.690***	0.779***	0.715***	0.686***	0.661***	0.658***	0.762***	0.614***	**0.755**

F1 = Zest, F2 = Resolution, F3 = Fortitude, F4 = Congruence between desired and achieved goals, F5 = Positive Self-concept, F6 = Sense of Control
F7 = Mood Tone, F8 = Forgiveness, F9 = Sufficiency Economy

a second-order factor encompassing the first four factors (Zest, Resolution, Fortitude, and Congruence)—yielded a better fit. These results align with theoretical models of Successful Aging and SOC, where distinct yet interrelated psychosocial strengths support overarching adaptive capacities.

Confirmatory factor analysis demonstrated that four domains—Zest, Resolution, Fortitude, and Congruence—loaded strongly onto a single, overarching second-order factor labeled Adaptive Vitality. This factor reflects core adaptive strengths, engagement, resilience, and relational harmony, which are central to well-being in later life. In addition, five distinct first-order domains—Positive Self-Concept, Sense of Control, Mood Tone, Forgiveness, and Sufficiency Economy—emerged as independent contributors to life satisfaction, each demonstrating substantial factor loadings. The final MLSA-36 model is best represented as a partial hierarchical (mixed first- and second-order) structure, supporting the theoretical rationale and empirical evidence for both higher-order and distinct first-order domains.

Regarding construct validity, the MLSA encountered poor discriminant validity among the first four dimensions, consistent with previous findings that life satisfaction in older adults can present as a unidimensional construct (as shown in prior studies and supported by the literature [29]. This convergence suggests that, in the context of older Thai adults, and in alignment with gerotranscendence theory, key psychosocial domains (e.g., zest and resolution) may be experienced less as distinct traits and more as facets of a holistic sense of well-being and life acceptance.

Convergent validity was generally supported, with an average variance extracted (AVE) above 0.50 for most dimensions and composite reliability (CR) above 0.7 for all. For some domains, slightly lower AVE values were observed, paralleling challenges in related research (e.g., low AVE in the short-form Life Satisfaction Index [30, 31]). Limited response variability, likely due to the mentally healthy and generally satisfied sample population, may have contributed to these findings [32]. This homogeneity, while strengthening methodological rigor for initial validation, limits the observable construct variance, a point consistent with prior work on instrument development and validation.

Given these results, item refinement may enhance discriminant validity, especially for closely related constructs such as Zest and Resolution. Merging the first four dimensions is empirically supported and theoretically consistent with both the SOC model's holistic approach and the unidimensional tendencies discussed in the literature. The six-factor solution thus provides a practical balance between comprehensive assessment and interpretability.

Table 4 The Heterotrait-Monotrait ratio (HTMT) analysis

	F3	F4	F5	F6	F7	F2	F8	F1	F9
F3									
F4	0.870								
F5	0.743	0.742							
F6	0.792	0.727	0.807						
F7	0.624	0.634	0.774	0.782					
F2	0.930	0.757	0.703	0.697	0.567				
F8	0.802	0.775	0.769	0.790	0.793	0.758			
F1	0.786	0.784	0.702	0.567	0.539	0.902	0.693		
F9	0.694	0.782	0.718	0.672	0.66	0.654	0.761	0.612	

F1 = Zest, F2 = Resolution, F3 = Fortitude, F4 = Congruence between desired and achieved goals, F5 = Positive Self-concept, F6 = Sense of Control, F7 = Mood Tone, F8 = Forgiveness, F9 = Sufficiency Economy

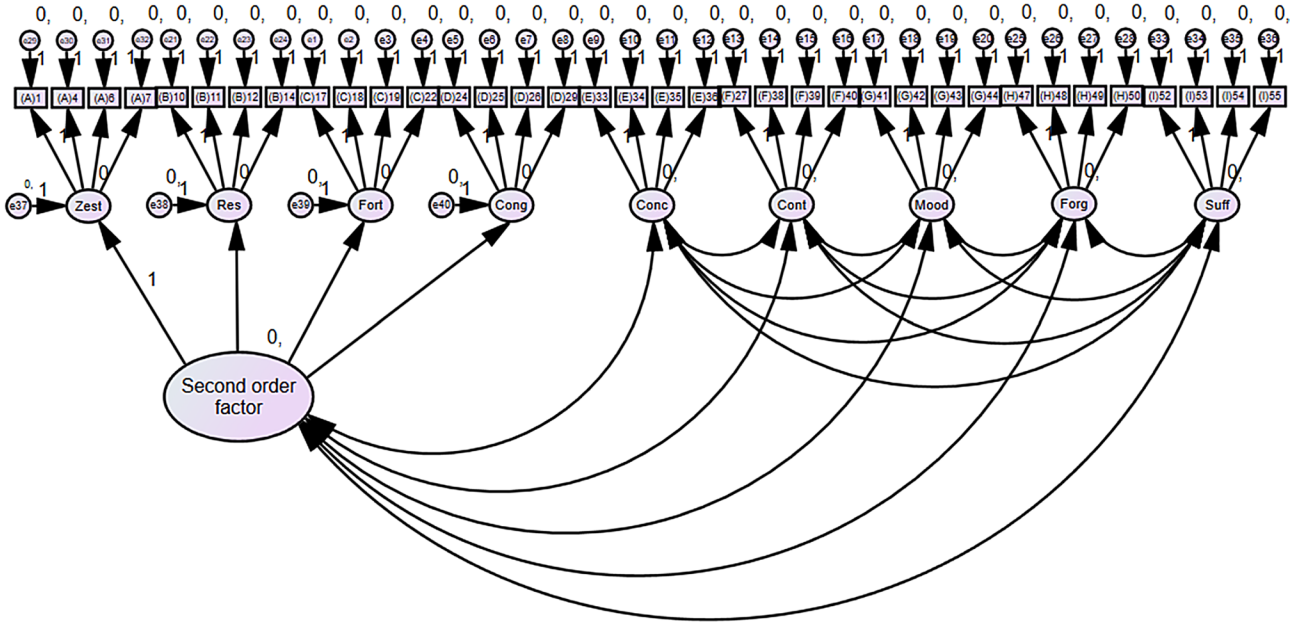

Fig. 4 The six-factor solution model of the 36-MLSA (with second-order factor)

Table 5 Correlation coefficients between EQ-5D index, RSES and MLSA-dimensions

	MLSA-Dimensions									
	Zest	**Resolution**	**Fortitude**	**Congruence**	**Positive**	**Sense**	**Mood**	**Forgive**	**Suff**	**MLSAtotal**
EQ-5D index	0.075	0.057	0.052	0.051	0.133**	0.078	0.140**	0.065	0.028	0.098*
RSES	0.210**	0.190**	0.259**	0.289**	0.397**	0.274**	0.358**	0.277**	0.309**	0.366**

EQ-5D = EuroQoL- 5 dimensions, RSES = Rosenberg self-esteem scale, MLSA = Multidimensional Life Satisfaction Assessment, Congruence = Congruence between desired and achieved goals, Positive = Positive Self-concept, Mood = Mood tone, Forgive = Forgiveness, Suff = Sufficiency Economy

Notably, the sufficiency economy dimension—deeply rooted in Thai culture and monarchy—emerged as distinct from other domains, underscoring the importance of integrating culturally specific values into life satisfaction measurement. This finding supports calls in the literature for culturally sensitive tools that move beyond Western individualistic frameworks, as Asian—and particularly Thai—models of well-being often incorporate collective, spiritual, and resilience-oriented domains. The prominence of forgiveness and sufficiency economy as scale domains also reflects the profound interweaving of Buddhist teachings and spiritual values in Thai society. Buddhist principles not only encourage moderation, resilience, and letting go of attachments but also facilitate social harmony and inner contentment, core elements of life satisfaction for many elders. The integration of spiritual dimensions into well-being assessment is thus particularly relevant in Thailand, where such beliefs serve as vital coping resources in later life.

The MLSA showed significant correlations with EQ-5D and self-esteem, supporting concurrent validity. The low correlation with EQ-5D is expected given the narrower

health focus of EQ-5D versus the broader achievements and resilience highlighted in life satisfaction theories (e.g., Successful Aging and gerotranscendence) [33, 34]. These results underscore the multi-faceted nature of well-being in later life, where social resources, coping strategies, and cultural values may sustain satisfaction despite health challenges.

Clinical applications and future research

In line with the above theoretical integration, the MLSA—especially its refined six-dimensional or total score format—offers clinicians and researchers a robust, culturally grounded tool for assessing overall life satisfaction and its core components among Thai older adults. Practically, the first-order factors (Positive Self-concept, Sense of Control, Mood Tone, Forgiveness, and Sufficiency Economy) and the second-order composite may be used flexibly, depending on research or clinical priorities. However, further validation is needed in more diverse samples, including individuals in various care settings or with differing health statuses, to confirm factor structure and broaden applicability.

By explicitly revisiting and drawing upon key concepts from Successful Aging, SOC, SST, and gerotranscendence, this study advances theoretical and practical understanding of life satisfaction in later life. It affirms the necessity of multidimensional, culturally adaptive assessment tools—and highlights the distinctiveness of the Thai context—thereby contributing to the fields of psychology, gerontology, and cross-cultural health research.

The involvement of older adult participants in the scale development process proved highly valuable. Their lived experiences, everyday language, and unique perspectives brought cultural relevance and practical insight to the item pool, particularly in shaping domains such as forgiveness and the sufficiency economy. While item selection ultimately drew on expert deliberation, the participatory process ensured that the instrument better reflected the realities and values of the target population.

Building on this experience, we advocate for continued and even deeper participatory research approaches in future scale or intervention development. Direct involvement of older adults as co-creators with clinicians and researchers can reveal needs, language, and values that top-down strategies may overlook. We believe that such participatory methodologies enhance the relevance, inclusivity, and ecological validity of assessment tools for older age groups.

Limitations

Some important limitations should be considered. For example, the study sample was relatively homogeneous in terms of socioeconomic background and health status.

In this study, the researchers did not utilize an alternative life-satisfaction scale to confirm the reliability, robustness, meaningfulness, and applicability of the results, commonly referred to as criterion validity. Furthermore, it was noted that the number of items in the MLSA might be considered lengthy and could potentially present a challenge for older participants. Therefore, it is suggested that shortening the scale should be considered to address this concern.

While our measure included domains inspired by Buddhist values, the diversity of spiritual engagement and religious practice among Thai older adults was not explicitly assessed. Future research should investigate individual differences in religiosity and spirituality, as well as their intersection with life satisfaction, to further refine tools and interventions for this context.

Conclusions

The Multidimensional Life-Satisfaction Assessment (MLSA) was designed to encompass various dimensions, drawing on both Western and Thai cultural perspectives. A nine-factor solution model demonstrated adequate fit with the observed data. However, the study did not establish discriminant validity. This lack of discriminant validity arises from the high correlation among items within each construct, indicating that the latent constructs are overlapping or redundant rather than distinct. This issue can be attributed to the lower variability observed in the sample studied.

However, the 36-item MLSA can still be clinically utilized by employing six dimensions and a total score to assess overall life satisfaction. Further replication studies conducted in different settings and cultures are encouraged to definitively confirm the construct validity of the MLSA.

Abbreviations

AVE	Average Variance Extracted
CFI	Comparative Fit Index
EQ-5D	EuroQol-5 Dimensions
HTMT	Heterotrait-Monotrait
MLSA	The Multidimensional Life-Satisfaction Assessment
RMSEA	Root-mean-square error of approximation
RSES	Rosenberg Self-Esteem Scale
SRMR	Standardized root mean square residual
TLI	Tucker-Lewis Index
WLSMV	Weighted least square means and variance adjusted

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s40359-025-03463-9.

Supplementary Material 1

Supplementary Material 2

Supplementary Material 3

Supplementary Material 4

Supplementary Material 5

Supplementary Material 6

Supplementary Material 7

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Author contributions
CP, NW, PU, TD, PK, WM, KS, NC, NP, CS, JN, SS, SK, and TW contributed substantially to the study conceptualization, design, and data acquisition. CP and NW wrote the main manuscript text. CP, NW, PU, TD, PK, WM, KS, NC, NP, CS, JN, SS, SK, and TW revised and approved the finalized manuscript before submission.

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Data availability
The datasets generated and/or analyzed during the current study are not publicly available due to ethics approval but are available from the corresponding author on reasonable request.

Declarations

Consent for publication
Not applicable.

Consent to participate
Informed consent was obtained from all individual participants included in the study. The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the ethics committee of the Mental Health Department Institutional Review Board, Thailand (DMH.IRB.COA 010/2561) under the protocol study code DMH.IRB 011/2561 BRm_Ful.

Competing interests
The authors declare no competing interests.

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References

1. Veenhoven R. Greater happiness for a greater number: did the promise of enlightenment come true? Soc Indic Res. 2017;130(1):9–25.
2. Havighurst RJ. Successful aging, In: Williams RH, Tibbitts C. Donohue W, editors. Processes of aging: Social and psychological perspectives, 1963. pp. 299–320.
3. Diener E, et al. The satisfaction with life scale. J Pers Assess. 1985;49(1):71–5.
4. Palmore E. Predictors of successful aging. Gerontologist. 1979;19(5 Pt 1):427–31.
5. Neugarten BL, Havighurst RJ, Tobin SS. The measurement of life satisfaction. J Gerontol. 1961;16:134–43.
6. Germani A, et al. The link between individualism-collectivism and life satisfaction among emerging adults from four countries. Appl Psychol Health Well Being. 2021;13(2):437–53.
7. Paz R, Neto F, Mullet E. Forgivingness: similarities and differences between Buddhists and Christians living in China. Int J Psychol Relig. 2007;17:289–301.
8. United Nations Department of Economic and Social Affairs. World population ageing 2019. United Nations; 2020.
9. Marquine MJ, et al. Differences in life satisfaction among older community-dwelling Hispanics and non-Hispanic Whites. Aging Ment Health. 2015;19(11):978–88.
10. Division of Mental Health Promotion and Development, social and psychological care guidelines for the elderly to prevent mental health problems (1st revision). 2015, Nonthaburi Thailand: Ministry of Public Health.
11. Realo A, Dobewall H. Does life satisfaction change with age? A comparison of Estonia, Finland, Latvia, and Sweden. J Res Pers. 2011;45:297–308.
12. Mroczek DK, Spiro A. Change in life satisfaction during adulthood: findings from the veterans affairs normative aging study. J Pers Soc Psychol. 2005;88(1):189–202.
13. Lim KT, Yu R. Aging and wisdom: age-related changes in economic and social decision making. Front Aging Neurosci. 2015;7:120.
14. Rowe JW, Kahn RL. Successful Aging Gerontologist. 1997;37(4):433–40.
15. Tornstam L. Gerotranscendence: A developmental theory of positive aging. Springer Publishing Company; 2005.
16. Abreu T, Araújo L, Ribeiro O. How to promote gerotranscendence in older adults? A scoping review of interventions. J Appl Gerontol. 2023;42(9):2036–47.
17. Abreu T, Araújo L, Ribeiro O. Religious factors and gerotranscendence in later life: A scope review of empirical studies. Curr Psychol. 2022;42.
18. Choochom O, et al. Research and development of the elderly Well-Being based on sufficiency economy philosophy. Warasan Phuettikammasat. 2020;26(1):42–60.
19. Mongsawad P. The philosophy of the sufficiency economy: a contribution to the theory of development. Asia-Pac Dev J. 2012;17(1):123–43.
20. Chuemchit M, et al. Health promotion behavior and needs assessment: what do Thai elderly want and need. Int J Social Sci Humanity. 2012;2(5):396.
21. Lim HJ, et al. Multidimensional construct of life satisfaction in older adults in korea: a six-year follow-up study. BMC Geriatr. 2016;16(1):197.
22. Oishi S, et al. The psychologically rich life questionnaire. J Res Pers. 2019;81:257–70.
23. Itsara Booyarit I. Thai conceptualizations of forgiveness within a work context: comparison with Western models. J Behav Sci. 2012;7(1):1–28.
24. Neugarten BL editor. Middle age and ageing: a reader in social psychology. Chicago: University of Chicago Press.
25. Henseler J, Ringle CM, Sarstedt M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. J Acad Mark Sci. 2015;43(1):115–35.
26. Gaskin J, James M, Lim J. Master validity tool. AMOS Plugin. 2019.
27. Li C-H. Confirmatory factor analysis with ordinal data: comparing robust maximum likelihood and diagonally weighted least squares. Behav Res Methods. 2016;48(3):936–49.
28. Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Struct Equ Model. 1999:6.
29. Bužgová R, et al. The Czech version of the life satisfaction index for the third age—short form (LSITA-SF12): psychometric properties. Int J Older People Nurs. 2023;n/a(n/a):e12541.
30. Fornell C, Larcker DF. Evaluating structural equation models with unobservable variables and measurement error. J Mark Res. 1981;18.
31. Li PS et al. Development and assessment of the validity and reliability of the Short-Form life satisfaction index (LSI-SF) among the elderly population. J Pers Med. 2022;12(5).
32. Cheung GW, et al. Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. Asia Pac J Manage. 2023.
33. Sexton E, et al. Does the EQ-5D capture the effects of physical and mental health status on life satisfaction among older people? A path analysis approach. Qual Life Res. 2017;26(5):1177–86.
34. Bužgová R, et al. Predictors of life satisfaction in elders living at home in the Czech Republic. PLoS One. 2023;18(3):e0283772.

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