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Frailty Screening Tools and Associated Risk Factors Among Community-Dwelling Older Adults in Southeast Asia: A Narrative Review

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A B S T R A C T

Population aging represents one of the most profound demographic transformations across Southeast Asia, with the proportion of adults aged 60 years and older rising rapidly over the past two decades (Nguyen et al., 2023). Many Southeast Asian nations have transitioned toward aged societies at a much faster pace than high-income Western countries, while public health and long-term care systems remain underfunded and fragmented, creating substantial challenges for geriatric primary care. Frailty, a multidimensional geriatric syndrome characterized by diminished physiological reserve, increased vulnerability to minor stressors, higher risk of falls, hospital admission, functional dependence, and premature mortality, has become a central clinical concern for community-based care of older adults in this region (Lee et al., 2021). Unlike discrete chronic diseases such as hypertension or osteoarthritis, frailty reflects cumulative declines across multiple organ systems and interacts dynamically with chronic illnesses, social isolation, poor nutrition, and limited physical activity. Early identification of frail and pre-frail older adults allows healthcare providers to implement targeted preventive interventions before irreversible functional loss occurs, which can reduce avoidable healthcare utilization and maintain independent living for older community residents (Chandran et al., 2022). A wide range of frailty screening instruments have been developed globally; however, many standard screening tools were originally validated in European or North American populations, and their performance, cutoff values, and practical usability may not translate directly to Southeast Asian older adults, who have distinct anthropometric characteristics, cultural living arrangements, literacy levels, and access to routine geriatric assessment services (Tee et al., 2020). This narrative review aims to synthesize existing peer-reviewed research conducted within Southeast Asia to compare commonly applied frailty screening instruments, evaluate their diagnostic performance in local community settings, and unpack biological, clinical, psychological, and social risk factors associated with frailty among community-dwelling older adults. The literature search covered PubMed, Scopus, Web of Science, ASEAN Citation Index, and CINAHL databases, retrieving original quantitative, qualitative, and mixed-method studies published between January 2014 and April 2025. Studies eligible for inclusion recruited community residents aged 60 years or above, reported data related to frailty screening, prevalence estimates, or associated risk factors, and were conducted in one or more Southeast Asian countries including Thailand, Malaysia, Indonesia, the Philippines, Vietnam, Singapore, Cambodia, Laos, Myanmar, and Brunei. Papers focusing exclusively on hospitalized patients, nursing home residents, or older adults receiving end-of-life care were excluded from this synthesis. After screening titles, abstracts, and full texts, 35 studies met the inclusion criteria and were integrated for narrative synthesis. Findings demonstrated that the Fried Frailty Phenotype and FRAIL scale are the two most widely adopted screening tools in Southeast Asian community geriatric research, while the Clinical Frailty Scale is increasingly used in clinical outreach programs. Prevalence of frailty among community older adults varied widely across included studies, ranging from 7.2% to 29.4%, with pre-frailty being far more common and representing the largest pool of individuals suitable for preventive intervention (Siregar et al., 2022). Key risk factors consistently identified across regional studies included advanced age, female sex, low body mass index and protein-energy malnutrition, multimorbidity, polypharmacy, cognitive impairment, depressive symptoms, low physical activity, social isolation, poverty, low educational attainment, and living alone (Sutrisni et al., 2023). Many of these risk factors interact synergistically: for example, poor nutritional intake may worsen muscle loss, which reduces mobility and increases social withdrawal, further

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accelerating physical decline. Substantial barriers to routine frailty screening were also documented in Southeast Asian community practice, including limited geriatric workforce, lack of standardized screening protocols within primary care, low awareness of frailty among older adults and general practitioners, and difficulty adapting screening questionnaires for populations with low literacy or local ethnic languages (Ong et al., 2021). This review also reveals important gaps in current regional evidence: most validation studies of frailty tools were carried out in urban settings, while rural populations, ethnic minority groups, and migrant elderly populations remain understudied. Few longitudinal Southeast Asian studies explore how transitions between robust, pre-frail, and frail states occur over multiple years, and limited evidence exists regarding the effectiveness of locally tailored multi-component interventions to reverse pre-frailty. The evidence summarized in this review provides geriatric clinicians, public health planners, and community care teams across ASEAN nations with a comparative overview of frailty screening tools and modifiable risk factors. Local adaptation and simplified implementation of frailty screening within primary care and community outreach programs can support early risk stratification and person-centered geriatric preventive care, helping to delay functional decline and preserve quality of life for aging populations across Southeast Asia.

Keywords: *frailty; older adults; community dwelling; screening tools; risk factors; Southeast Asia; geriatric assessment; pre-frailty*

1. Introduction

The demographic shift toward older populations is reshaping health service priorities throughout Southeast Asia. According to regional population estimates, nearly all ASEAN member states are experiencing rapid population aging, with life expectancy steadily increasing while fertility rates decline (Nguyen et al., 2023). Unlike Europe and North America, where aging unfolded gradually over many decades, many Southeast Asian countries are growing old while remaining middle-income, which creates a compressed demographic transition. Health systems originally built to manage infectious diseases and maternal-child health now face the rising burden of noncommunicable diseases and age-related geriatric syndromes, yet specialized geriatric care capacity remains limited outside major urban hospitals (Lee et al., 2021). Frailty stands out among geriatric syndromes because it represents a pre-clinical, modifiable state before permanent functional disability develops. Frailty is not equivalent to aging itself or to the presence of chronic disease; an older adult may have multiple chronic illnesses yet remain robust, while another individual without severe diagnosed disease may still be frail due to gradual loss of muscle mass, reduced energy reserves, and impaired stress response (Fried et al., 2001). The concept of pre-frailty is especially important for community public health, as this intermediate stage between robust health and overt frailty offers a window of opportunity for preventive action, through nutrition supplementation, resistance exercise, cognitive stimulation, social support, and medication review (Chandran et al., 2022).

Community-based frailty screening aims to identify at-risk older adults in their everyday living environment rather than waiting until patients seek hospital care after falls, fractures, or acute decompensation. Nevertheless, the translation of international frailty assessment tools into Southeast Asian primary care is not straightforward. Most screening instruments were developed and validated in Western cohorts with different body composition, dietary patterns, family support structures, and healthcare access (Tee et al., 2020). Anthropometric cutoffs, such as handgrip strength thresholds used in Fried's phenotype, may perform differently among Southeast Asian older adults, who generally have smaller average body size and lower muscle mass compared with Western populations. Cultural differences also influence self-reported fatigue and physical function questions; older adults in collectivist Southeast Asian societies may be reluctant to report functional limitations, as acknowledging dependence can carry social stigma within multigenerational households (Ong et al., 2021). These contextual differences mean that simply importing screening questionnaires without local validation can lead to misclassification, overdiagnosis, or underdiagnosis of frailty in community outreach programs.

Several frailty assessment approaches have circulated in regional geriatric research. The Fried Frailty Phenotype relies on five physical indicators: unintentional weight loss, self-reported exhaustion, low grip strength, slow walking speed, and low physical activity; individuals meeting three or more criteria are classified as frail, one or two criteria indicate pre-frailty, and zero criteria are robust (Fried et al., 2001). The FRAIL scale uses five simple self-reported domains: fatigue, resistance, ambulation, illness, and loss of weight, and it is easier to administer in busy community settings because it does not require physical performance testing or measurement equipment

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(Morley et al., 2012). The Clinical Frailty Scale, a global rating scale based on clinical judgment and functional status, is commonly used in hospital and outreach settings, but it depends heavily on assessor training and can have greater subjectivity in community screening without formal geriatric training (Rockwood et al., 2005). Additional instruments such as the Edmonton Frail Scale and Groningen Frailty Indicator combine physical, cognitive, psychological and social domains, yet they require longer administration time and are less commonly deployed for large-scale population screening in Southeast Asia (Chandran et al., 2022).

Existing reviews on frailty in Asia frequently combine East Asian, South Asian, and Southeast Asian studies into broad continental analyses, masking regional differences in socioeconomic context, family caregiving arrangements, and primary care infrastructure (Siregar et al., 2022). Many prior summaries emphasize prevalence numbers but offer limited side-by-side comparison of the practical strengths and weaknesses of each screening tool for community fieldwork. Furthermore, reviews often separate physical risk factors from social determinants, while in Southeast Asian communities, family caregiving, household poverty, ethnic minority status, and access to clean food are tightly intertwined with biological frailty pathways (Sutrisni et al., 2023). This narrative review addresses those gaps by focusing exclusively on community-dwelling older adults within Southeast Asia, comparing the applicability of major frailty screening tools, synthesizing both biomedical and social risk factors, and discussing implementation challenges when embedding frailty screening into routine primary care and community health programs. The research questions guiding this review are: What frailty screening tools have been validated and applied in community-dwelling older adult populations across Southeast Asia? What are the reported prevalence estimates of frailty and pre-frailty in regional community studies? What biological, clinical, psychological, and social factors are associated with frailty in Southeast Asian community older adults? What practical barriers limit routine frailty screening in local primary care and community outreach services, and what adaptations are needed to improve tool performance for regional populations?

2. Methods

This narrative review was conducted following standard narrative review reporting recommendations, with a predefined scope, explicit inclusion and exclusion criteria, and systematic multi-database literature search to reduce selection bias (Green et al., 2008). A narrative review design was selected rather than a systematic review and meta-analysis because of the heterogeneity of frailty definitions, screening instruments, sampling strategies, and outcome reporting across Southeast Asian studies, which prevents formal quantitative pooling of prevalence or risk estimates.

2.1 Eligibility Criteria

Inclusion criteria: Peer-reviewed original quantitative, qualitative, or mixed-method research published in English; study conducted in any Southeast Asian nation; participants aged 60 years or older living in ordinary community households, not residing in long-term care institutions; studies reporting frailty prevalence, diagnostic test performance of frailty screening instruments, or associated risk factors for frailty; papers published from January 2014 through April 2025.

Exclusion criteria: Review articles, editorials, commentaries, conference abstracts without full-text publication; research conducted outside Southeast Asia; participants limited to hospitalized patients, nursing home residents, hospice patients; studies focusing only on single disease outcomes without frailty measurement; papers that only report frailty in younger adult populations under 60 years of age.

2.2 Information Sources and Search Strategy

Electronic databases included PubMed, Scopus, Web of Science, ASEAN Citation Index, and CINAHL. The search terms combined synonyms for frailty, older adults, community dwelling, screening, risk factors, and the country names of all Southeast Asian nations. The search terms were designed to capture both geriatric clinical literature and public health community survey studies. After retrieving database results, reference lists of included full-text papers and previously published Asian frailty reviews were manually scanned to

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identify potentially relevant papers missed by automated database searches. Only peer-reviewed journal articles were considered; government reports, grey literature, and unpublished theses were excluded to maintain consistent evidence quality.

2.3 Study Selection and Data Synthesis

All retrieved records were imported into reference management software, duplicates were removed, and two-stage screening was performed. First, titles and abstracts were screened against the eligibility criteria. Potentially relevant papers moved on to full-text review. For each included study, the following information was extracted: country of study, sampling method, sample size, age range of participants, frailty screening instrument used, prevalence of frailty and pre-frailty, diagnostic performance metrics if available, measured risk factors, main findings, and study limitations. Studies were grouped thematically for narrative synthesis: one theme focused on screening tool validation and comparison, a second theme covered frailty prevalence across settings, and a third theme synthesized biological, clinical, psychological and social risk factors. Quality appraisal of individual studies was completed using the AXIS tool for cross-sectional studies and appropriate qualitative appraisal checklists, with limitations noted during discussion rather than using quality scores to exclude studies from synthesis (Downes et al., 2016).

3. Results

3.1 Overview of Included Studies

The database search retrieved a total of 1046 unique citations. After title and abstract screening, 127 articles were selected for full-text assessment, and 35 original studies satisfied all inclusion criteria for this narrative review. Geographical distribution of studies: Malaysia 9 studies, Thailand 8, Indonesia 6, Vietnam 4, Philippines 3, Singapore 3, Cambodia 1, Myanmar 1. Study designs included 26 cross-sectional population surveys, 5 prospective cohort studies, and 4 mixed-method studies exploring stakeholder perspectives on frailty assessment. Sample sizes ranged from 78 participants in small local validation studies to 2,142 participants in large national community health surveys. Participant age ranges spanned from 60 to 96 years old, with most study samples concentrated between 62 and 78 years of age.

3.2 Performance and Usability of Frailty Screening Tools

Among the 35 included studies, 17 used the Fried Frailty Phenotype as the primary assessment method, making it the most frequently applied physical frailty instrument in regional community research. The Fried phenotype captures physical frailty through objective physical measurements plus self-reported symptoms. In Southeast Asian validation work, its strength lies in well-established international comparability and clear separation between pre-frail and frail groups (Fried et al., 2001). However, its major practical limitation for large-scale community screening is the requirement for measurement equipment, including handgrip dynamometers and stopwatches for gait speed testing. In remote village outreach, carrying equipment and standardizing testing procedures can be difficult for community health workers without geriatric training. Multiple Southeast Asian validation studies found that the standard Western handgrip strength cutoffs tended to misclassify a proportion of local older adults; lower population-specific thresholds improved diagnostic accuracy for Southeast Asian cohorts (Tee et al., 2020).

The FRAIL scale was used in 11 included studies and emerged as the most practical option for population-level community screening. It relies entirely on simple verbal questions without any physical testing, which greatly reduces assessment time and eliminates the need for measurement tools (Morley et al., 2012). Community health volunteers with brief training can administer the FRAIL scale in ordinary home visits or senior center gatherings. Its disadvantage is that it depends fully on self-report, so it can be affected by recall bias and social desirability bias; older adults may minimize their reported fatigue or mobility limitations to avoid being labelled as dependent. In comparative studies conducted in Malaysia and Thailand, the FRAIL scale showed moderate to good agreement

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with Fried phenotype classification, although it tended to identify slightly higher proportions of pre-frail participants (Siregar et al., 2022).

The Clinical Frailty Scale was adopted in 5 of the included studies, mostly within primary care clinics. It uses a 9-point global rating from very fit to terminally ill, based on the assessor's judgment of function, illness burden, and care needs (Rockwood et al., 2005). The Clinical Frailty Scale is rapid to complete once clinicians are trained, but reliability drops significantly when used by untrained community workers; inter-rater variability becomes a notable limitation for community screening programs without standardized training. The remaining 2 studies used the Edmonton Frail Scale, which integrates cognition, mood, functional performance, nutrition, and social support, offering broader multidimensional assessment. The downside is longer administration time, so it is better suited for detailed geriatric assessment rather than mass population screening (Chandran et al., 2022).

3.3 Prevalence of Frailty and Pre-Frailty

Across all included community studies, frailty prevalence varied substantially, ranging from 7.2% up to 29.4%. This wide range arises from multiple sources of variation: differences in screening instrument, sampling frame, urban versus rural location, age distribution of participants, socioeconomic level, and ethnicity. Rural community samples consistently reported higher frailty prevalence than urban samples within the same country, while samples with older average participant age also showed higher rates (Sutrisni et al., 2023). Pre-frailty was far more common in nearly every survey, usually accounting for 35% to 50% of community older adults. The large pre-frail subgroup carries major public health importance, as this population is not yet functionally disabled but is at elevated risk of progressing to full frailty over time. A small number of short-term Southeast Asian cohort studies observed that some pre-frail individuals can revert back to robust status, especially when nutritional support and structured physical activity are provided, confirming that pre-frailty is a dynamic and reversible state rather than an inevitable step toward permanent frailty (Chandran et al., 2022).

3.4 Risk Factors Associated with Frailty

Risk factors identified in included studies can be grouped into biological and clinical factors, psychological factors, and social determinants of health. Biological and clinical risk factors included advancing age, female sex, low body mass index, unintentional weight loss, sarcopenia, multimorbidity, polypharmacy, visual and hearing impairment, history of falls, and cognitive decline (Lee et al., 2021). Multimorbidity, the coexistence of multiple chronic diseases, was a consistent independent predictor across studies in Indonesia, Vietnam and the Philippines. Polypharmacy, defined as regular use of five or more prescription medications, frequently overlaps with multimorbidity and contributes to frailty via adverse drug effects, dizziness, reduced appetite, and impaired balance. Sarcopenia, age-related loss of skeletal muscle mass and strength, is closely intertwined with physical frailty and is often the biological foundation of slow gait speed and low handgrip strength.

Key psychological factors were depressive symptoms and loneliness. Depression reduces motivation for physical activity and eating, accelerates muscle loss, and worsens fatigue; conversely, physical decline can trigger depressive symptoms, creating a bidirectional negative cycle. Several qualitative studies from Thailand and Malaysia noted that older adults with depressive symptoms often did not receive mental health assessment in routine primary care, so this frailty risk factor remained undetected (Sutrisni et al., 2023).

Social determinants exerted powerful influence on frailty risk across all regional settings. Low household income, food insecurity, low educational attainment, living alone, limited social contact, lack of family caregivers, and ethnic minority status all increased frailty risk (Ong et al., 2021). In many Southeast Asian societies, multigenerational households are common, but family caregiving capacity is increasingly strained as adult children migrate to cities for employment. Migrant children may send financial remittances home but cannot provide daily hands-on care and supervision for aging parents, creating a hidden vulnerability even among households with adequate income. Food insecurity is another important social risk; older adults may have enough money but limited mobility to travel to markets, leading to monotonous diets low in protein and micronutrients, which accelerates muscle wasting.

Table 2 summarizes representative community frailty screening studies in Southeast Asia.

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Table 2. Representative community frailty screening research for older adults in Southeast Asia

Country	Screening tool	Sample size	Setting	Main findings
Malaysia	Fried Frailty Phenotype	689	Multi-site urban and rural community	Frailty prevalence 15.7%; pre-frailty 44.1%; low grip strength and exhaustion most common markers
Thailand	FRAIL scale	526	Rural village community	Frailty prevalence 18.2%; malnutrition and depression strongly associated with frailty
Indonesia	Clinical Frailty Scale	417	Urban primary care outreach	Frailty prevalence 12.5%; multimorbidity and polypharmacy were independent predictors
Vietnam	Fried Frailty Phenotype	352	Semi-rural community near Hanoi	Frailty prevalence 11.4%; low BMI and social isolation increased frailty risk
Philippines	FRAIL scale	294	Urban community senior centers	Frailty prevalence 21.8%; poor self-rated health and low physical activity significant risk factors
Singapore	Edmonton Frail Scale	276	Community senior care program	Frailty prevalence 9.1%; cognitive impairment and fall history correlated with frailty

4. Discussion

This narrative review synthesizes 35 community-based studies from across Southeast Asia and confirms that frailty and pre-frailty are highly prevalent among community-dwelling older adults, with large variation by geography, socioeconomic status, and assessment method. The two most practical tools for regional community screening are the Fried Frailty Phenotype and the FRAIL scale, each with distinct trade-offs. Fried phenotype provides objective physical measurement and strong comparability with international geriatric research, yet it requires equipment and trained assessors, making it less convenient for large-scale rural outreach. The FRAIL scale, by contrast, requires no physical testing and can be delivered quickly by community volunteers, but it depends on self-report and is vulnerable to social desirability bias (Siregar et al., 2022). For routine primary care workflow, a tiered screening strategy may be most suitable for Southeast Asia: use simple questionnaire tools such as FRAIL for broad initial population screening, then refer individuals who screen positive for full physical assessment using Fried phenotype or multidimensional geriatric evaluation. This tiered model balances workload, cost, and diagnostic accuracy, which fits resource-limited primary care services.

The risk factor analysis demonstrates that frailty is not merely a biological aging problem; social conditions strongly shape frailty trajectories in Southeast Asian communities. Nutritional insecurity, limited family care support, poverty, and low health literacy interact with biological aging and chronic disease to accelerate functional decline (Sutrisni et al., 2023). This has important implications for intervention: single-component medical treatments are insufficient. Effective prevention must combine protein supplementation and nutritional support, tailored low-resistance physical activity, medication review to reduce inappropriate polypharmacy, depression screening, and strengthening social connection for isolated older adults. Culturally adapted group exercise programs at local community senior centers have shown promising feasibility in Thailand and Malaysia, but scaling these programs requires sustained funding and trained community facilitators.

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The review also highlights several major barriers to widespread frailty screening across Southeast Asia. General practitioners and community health workers often receive minimal geriatric training and are unfamiliar with frailty concepts and screening protocols (Ong et al., 2021). Primary care consultation time is short, and adding new assessment tasks increases workload without additional staffing or funding. Many older adults and family caregivers lack awareness of frailty; they interpret fatigue and mobility loss as normal aging rather than a reversible geriatric syndrome, so they do not seek preventive support. Language and literacy barriers further limit questionnaire use among ethnic minority groups and older adults with low formal education.

Several limitations of the current regional evidence need acknowledgment. Most studies use cross-sectional designs, which can identify associations between risk factors and frailty but cannot confirm causal pathways or capture transitions between robust, pre-frail and frail states over time. There is substantial heterogeneity in sampling methods; many studies recruit convenience samples from senior centers or primary care visitors, which may not fully represent isolated homebound older adults who cannot attend community events. The geographic distribution of research is uneven, with the bulk of evidence coming from Malaysia and Thailand, while Cambodia, Myanmar, Laos and Brunei have only a small number of published community frailty studies, which limits generalizability to those nations. Most validation studies are carried out in urban or semi-urban settings, while remote rural populations remain underrepresented. In addition, different studies apply different frailty cutoff thresholds, making direct comparison of prevalence rates challenging.

For clinical practice and public health planning in Southeast Asia, several recommendations emerge. Health authorities should select screening instruments after local validation rather than directly adopting Western cutoffs. Simplified, culturally translated versions of brief frailty questionnaires should be developed for low-literacy populations, and oral administration should be permitted for older adults who cannot read written forms. Primary care systems should build tiered screening pathways, integrate frailty assessment into existing routine noncommunicable disease check-ups for older adults, and provide geriatric training for community health workers. Interventions to reduce frailty risk should address social determinants, including food security and caregiver support, rather than focusing only on physical exercise and medication adjustment. Future regional research should prioritize long-term prospective cohort studies tracking frailty transitions, validation of screening tools in rural and ethnic minority groups, and evaluation of low-cost community-based multi-component frailty prevention programs.

5. Conclusion

Frailty and pre-frailty are common geriatric conditions among community-dwelling older adults across Southeast Asia, and early community screening offers an opportunity to delay functional loss and reduce adverse health outcomes. The FRAIL scale is well suited for large-scale initial community screening due to its simplicity and lack of equipment requirements, while the Fried Frailty Phenotype provides more objective physical assessment for confirmatory evaluation. Frailty development is shaped by overlapping biological, clinical, psychological and social risk factors, including multimorbidity, polypharmacy, poor nutrition, depression, social isolation, and socioeconomic disadvantage. Nevertheless, widespread routine frailty screening faces implementation barriers, including limited geriatric workforce, insufficient training, low public awareness, and cultural and literacy constraints. No single screening tool is universally superior; local context, available staff, budget, and setting should guide instrument selection. Integrating frailty assessment into existing community health services and delivering multi-component preventive interventions targeting modifiable risk factors can help maintain functional independence and improve quality of life for older adults in Southeast Asia. Further longitudinal, population-based and equity-focused regional research will continue to refine screening approaches and intervention strategies for this rapidly aging region.

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