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The Role of Public Health Nurses in Urban Areas among Frailty Screening and Assessment

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บทคัดย่อ

ประชากรผู้สูงอายุที่เพิ่มมากขึ้นโดยเฉพาะในเขตเมือง ก่อให้เกิดความท้าทายสำคัญต่อระบบสาธารณสุข ภาวะเปราะบาง (Frailty) คือ ภาวะที่มีการเสื่อมถอยของอวัยวะหรือระบบต่าง ๆ ในร่างกายเป็นกลุ่มอาการที่พบได้บ่อยในกลุ่มผู้สูงอายุ ภาวะนี้เพิ่มความเสี่ยงต่อผลลัพธ์ทางสุขภาพที่ไม่พึงประสงค์ เช่น การหกล้ม กระดูกหัก และคุณภาพชีวิตที่ลดลง การคัดกรองเพื่อค้นหาผู้ที่มีภาวะเปราะบางเป็นสิ่งที่สำคัญและจำเป็น แบบประเมินภาวะเปราะบาง (FRAIL scale) เป็นเครื่องมือที่มีประสิทธิภาพในการคัดกรองภาวะเปราะบาง ใช้งานง่าย เข้าถึงได้สะดวก และใช้เวลาน้อย รวมทั้งสามารถใช้ได้ทั้งในชุมชนเมืองและสถานดูแลผู้สูงอายุ บทความนี้กล่าวถึงบทบาทสำคัญของพยาบาลในเขตเมืองในการคัดกรองและประเมินภาวะเปราะบางที่ได้จากแนวทางการปฏิบัติของกระทรวงสาธารณสุขและการทบทวนวรรณกรรม โดยเน้นย้ำถึงความสำคัญของการตรวจพบตั้งแต่ระยะแรก การป้องกันภาวะเปราะบางและการส่งเสริมสุขภาวะของผู้สูงอายุในสภาพแวดล้อมเขตเมืองโดยใช้หลักฐานเชิงประจักษ์ โดยการรักษาสมรรถภาพทางด้านร่างกาย การรับรู้ และภาวะโภชนาการของผู้สูงวัย เพื่อตอบสนองความต้องการเฉพาะของผู้สูงอายุในเขตเมือง ซึ่งจะช่วยเสริมสร้างผลลัพธ์ทางสุขภาพและลดภาระของระบบสาธารณสุข

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Abstract

The growing aging population, particularly in urban areas, presents significant challenges for healthcare systems. Frailty is a condition characterized by the decline of various organs or bodily systems and is commonly found among older adults. This condition increases the risk of adverse health outcomes, such as falls, fractures, and reduced quality of life. Screening for frailty is essential in identifying at-risk individuals. The FRAIL scale is an effective screening tool that is easy to use, accessible, time-efficient, and applicable in both urban communities and elderly care settings. This article highlights the critical role of public health nurses in urban areas among frailty screening and assessment, based on guidelines from the Ministry of Public Health and a literature review. It emphasizes the importance of early detection, frailty prevention, and health promotion among older adults in urban settings through evidence-based practices. Maintaining physical, cognitive, and nutritional capacities is essential to addressing the specific needs of urban older adults, ultimately improving health outcomes and reducing the burden on public health systems.

Keywords: Frailty, Nurses' Roles, Older Adults, Public Health Nurses, Urban Areas

Introduction

The population of adults over 60 is expected to nearly double between 2015 and 2025. Moreover, those population will increase from 1 billion in 2020 to 1.4 billion. By 2050, this will pose significant challenges to healthcare systems worldwide (World Health Organization, 2024). In Thailand, Bureau of Elderly Health (2024a) reported that older adults comprised over 10% of the population, projected to rise to 28% by 2035, with frailty prevalence among community-dwelling older adults affecting nearly 22% (Srinonprasert, Chalermsri, & Aekplakorn, 2018; Thanasiri, 2021). Department of Older Persons (2022) reported the highest older adult population located in urban areas, especially Bangkok (22.1%) and Chonburi (15.2%) in 2022. The aging process often leads to reduced muscle strength and increased fatigue, resulting in frailty for about 10% of individuals over 65 years old (Age UK, 2020; Erber, 2020). Health promotion and preventive care are essential to decreasing the prevalence of frailty within communities (Chen, Gan, & How, 2018; World Health Organization, 2020). However, older adults in urban and rural areas often display different health behaviors, which may impact their care needs.

Frailty is a common condition resulting from age-related physical changes among older adults. Older adults who are frail are more probable to experience adverse health outcomes, such as falls, fractures, dementia, and disability (Martínez-Montas, Sanz-Matesanz, Benítez-Sillero, & Martínez-Aranda, 2025). These conditions can all lead to a lower quality of life and higher expenses and utilization of healthcare resources, including hospital stays, and institutionalization that healthcare professionals should prioritize (Kojima, Liljas, & Iliffe, 2019). However, its definition varies based on different perspectives. According to Fried et al. (2001), frailty is defined, including in urban communities in Thailand, as a clinical syndrome characterized by the presence of three or more of the following criteria: unintentional weight loss, self-reported exhaustion, weakness evidenced by decreased grip strength, slow walking speed, and low physical activity (Srinonprasert, 2023). Alternatively, frailty is also understood as a decline in the reserves of multiple bodily systems, leading to increased vulnerability. It includes a field of physical, psychological, and social deficits that interact with each other and affect a person's quality of life (Clegg, Young, Iliffe, Rikkert, & Rockwood, 2013). According to the mentioned, the definition could emphasize physical fatigue conditions such as muscle strength, walking speed, and balance as the main idea according to adverse health outcomes. Public health nurses in urban areas take a critical part in addressing these challenges by implementing frailty screening and assessment tools, tailoring interventions to diverse urban populations, and promoting preventive care strategies. Despite of the advancements in screening methods, gaps remain in identifying tools that effectively address the unique needs of older adults in urban settings (Fang, Phung, Olley, & Lee, 2024). Moreover, differences in behavior, environment, and economic factors must be considered when developing effective strategies to address specific frailty screening, assessment tools, and nursing care in diverse populations (Clegg, Young, Iliffe, Rikkert, & Rockwood, 2013; Liu, Zhu, Tan, Ismail, Ibrahim, & Hassan, 2024).

Although many tools have been developed in recent years to screen and assess frailty in older adults, the results could still differ according to variations in environment, lifestyle, or economic status that may cause different care needs for older adults in urban areas. There are unclear screening and assessment tools for frailty in urban areas. This article explores the role of public health nurses in frailty screening and assessment in urban areas, evaluates current practices, and highlights opportunities for evidence-based improvements to enhance the care of older adults in urban communities. It specifically focuses on healthcare professionals, particularly

public health nurses, and is informed by the best available evidence from the Ministry of Public Health, a comprehensive literature review, and the author's experience working with older adults in urban settings for over one year.

The Role of Public Health Nurses in General Setting among Frailty Screening and Assessment

Public health nurses, particularly those specializing in frailty, play a crucial role in the comprehensive assessment of service users, the promotion of public health, and the prevention of illness among older adults. Early detection of frailty is essential, as timely interventions can help delay its progression and empower patients to actively engage in self-management (Horner, 2022). The integration of screening tools and evidence-based clinical decision-making enables healthcare professionals to identify at-risk individuals and implement strategies to mitigate their risk. Effective frailty screening and assessment are vital in preventing adverse health outcomes, such as fractures and falls, thereby improving overall well-being and reducing healthcare burdens (Dinarvand, Panthakey, Heidari, Hassan, & Ahmed, 2024).

Deng and Sato (2024) identified several globally recognized frailty screening tools commonly used between 2001 and 2023, including Fried's Frailty Phenotype (FP), the Groningen Frailty Indicator (GFI), the Frailty Index (FI), the Clinical Frailty Scale (CFS), the Edmonton Frail Scale (EFS), and the Tilburg Frailty Indicator (TFI). However, each country adopts a frailty assessment tool that aligns with its healthcare system and population needs. Currently, the FRAIL scale is frequently utilized in cases where the Barthel Index of Activities of Daily Living (ADL) has already declined (Department of Medical Services, 2021). This reactive approach primarily addresses frailty after older adults begin requiring assistance with daily tasks or relying on others for care. However, such late-stage evaluations fail to prevent frailty from developing, emphasizing the need for more proactive screening and intervention strategies. Community nurses can lower the risks associated with frailty by promoting health activities and providing self-care advice, in addition to performing frailty screenings and assessments.

Several tools are available for frailty screening and assessment, and selecting one that is accessible and reliable is crucial. The Fried frailty assessment tool from Fried et al. (2001) is widely used due to its comprehensive approach, which evaluates physical, mental, and functional components. This tool includes five criteria, one of which is muscle weakness,

assessed using a hand grip dynamometer. This measurement not only detects muscular weakness but also aids in identifying sarcopenia. When frailty is detected, targeted interventions can be implemented to address specific needs.

Despite the tool's reliability and ease of use, current practice often relies on the FRAIL scale only after ADL has already declined. Early-stage frailty assessments, such as those using a modified clinical phenotype of frailty, are primarily confined to research settings. Expanding the use of these early assessment methods in clinical practice could significantly enhance frailty prevention efforts.

Frailty Screening and Assessment

In urban communities, particularly Bangkok, frailty assessment tool modified from Fried et al. (2001) is commonly used in research settings to screen and evaluate frailty in older adults (Table 1). This tool divides people into two categories: pre-frailty, which is defined by the presence of one or two items, and frailty, which is defined by the presence of three or more items from the following five components. However, details of each component may differ depending on the policy and settings.

1. Weight Loss: Unintentional weight loss of more than 4.5 kilograms or 5% of body weight in the past year is assessed, excluding cases of weight loss due to exercise or dieting. For individuals lacking recorded weight data, the Center for Epidemiological Studies-Depression Scale (CES-D) Depression Scale serves as a substitute. Participants are asked how often in the past week they experienced a lack of appetite or reduced desire to eat (No = 0, Yes = 1).

2. Exhaustion: Exhaustion is assessed using two CES-D Depression Scale questions: “How often in the past week did you feel that everything you did was difficult?”, and “How often in the past week did you feel unable to do things?”. Responses are scored on a four-point scale: 0 = Rarely or none of the time (<1 day), 1 = Some or a little of the time (1-2 days), 2 = A moderate amount of the time (3-4 days), 3 = Most of the time (5-7 days). A score of 2 or 3 on either question categorizes the individual as frail under the exhaustion criterion (No = 0, Yes = 1).

3. Weakness: Grip strength is measured using a hand grip dynamometer, with results adjusted for gender and body mass index (BMI). Individuals with grip strength in the lowest 20% at baseline are categorized as frail for this component (No = 0, Yes = 1).

4. Low Walking Speed: Walking speed is evaluated using the Timed Up and Go Test (TUGT), which measures the time taken to walk 15 feet (approximately 5 meters). Individuals in the slowest 20% of their population, adjusted for gender and standing height, are categorized as frail under this criterion (No = 0, Yes = 1).

5. Low Physical Activity: Physical activity is assessed using the International Physical Activity Questionnaire (IPAQ), which measures the frequency and duration of activities that elevate heart rate, such as walking, household chores, gardening, running, dancing, or cycling. Energy expenditure is calculated in kilocalories per week (kcals/week). Thresholds are as follows: Men: Less than 383 kcals/week, Women: Less than 270 kcals/week. Individuals below these thresholds are classified as having low physical activity (No= 0, Yes = 1).

The assessment results offer practical insights: Non-frailty (0 scores) signifies robust health; pre-frailty (1-2 points) identifies those at risk of developing frailty, allowing for early intervention, and frailty (3 or more points) indicates individuals who require specific programs to manage and decrease frailty-related risks. Using this comprehensive instrument, urban nurses can detect frailty in older persons, allowing for early interventions that enhance health outcomes and lower the risk of adverse events including falls, fractures, and loss of independence (Jaidee, & Sasat, 2017).

Table 1 Clinical phenotype of frailty

weight loss	Unintentional weight loss of more than 4.5 kilograms
exhaustion	Poor endurance and energy, self-reported from the CES-D Depression Scale
weakness	Hand-grip strength in the lowest 20% at baseline adjusted for gender and body mass index
low walking speed	Walking speed in the slowest 20% of their population, adjusted for gender and standing height
low physical activity	Low physical activity during the past week, measured by the International Physical Activity Questionnaire

Modified from Fried et al. (2001), with permission from Chulalongkorn University.

The frailty screening tool modified from Fried et al. (2001), while widely used and standardized, has significant limitations in terms of reliability (Bahat et al., 2022; Jaidee, & Sasat, 2017). One significant disadvantage is that it depends on self-reported information, which can

introduce inaccuracies due to recall bias or subjective interpretation by respondents. Furthermore, the observed differences in frailty incidence across studies are influenced not only by demographic and geographic factors, but also by the variety of assessment tools used. To address these issues, a standardized frailty screening tool that is appropriate for the current social and cultural context is required. Such a tool would improve the consistency and accuracy of frailty assessments, resulting in improved healthcare systems and health outcomes for older adults.

Change of practice

People have long been drawn to urban communities because of the numerous benefits they provide, including proximity to workplaces, recreational activities, healthcare services, and public transportation (Glazener et al., 2021). However, urban living presents significant health risks, including higher rates of poor nutrition and Non-communicable disease (NCDs) caused by modern lifestyle behaviors such as fast-food consumption, limited physical activity, and issues such as office syndrome (Alqunaibet, Herbst, El-Saharty, and Algwizani, 2021; Angkurawaranon, Lerssrimonkol, Jakkaew, Philalai, Doyle, & Nitsch, 2015). Moreover, Tupanich, Chaiyalap, and Chaiyalap (2019) found that the majority of older adults living in urban areas experience chronic conditions such as hypertension, diabetes, musculoskeletal disorders, and eye diseases. These health issues are often linked to the aging process and physiological changes, which can contribute to frailty. Therefore, it is essential to develop targeted and effective strategies for the systematic prevention and management of these conditions (Muhammad, Tahir, Hayat, & Chong, 2020).

Comprehensive analyses of major frailty assessment tools were conducted to evaluate their suitability for various application scenarios. These findings underscore the need for a critical assessment of existing initiatives based on the criteria for responsible screening. Several of these criteria are also essential for early detection and intervention programs, including the necessity of a reliable screening method and the availability of effective follow-up interventions. Furthermore, the results highlight the importance of utilizing frailty assessment tools that have been validated, demonstrate reliability, possess high sensitivity for early detection, are user-friendly, and exhibit high specificity for accurate diagnosis (Lette, Baan, van den Berg, & de Bruin, 2015).

Although the FRAIL scale is commonly used in urban communities, it is often applied only after older adults have already experienced a decline in Activities of Daily Living (ADL). This reactive approach contradicts the principle of early detection. Therefore, prioritizing the FRAIL scale for early frailty detection among older adults would be more appropriate (Table 2). The FRAIL scale, consisting of five self-assessed items, is a suitable tool for interviewing older adults in community settings. Its advantages include being short, simple, and easy to use, making it ideal for early frailty detection (T Sriwong et al., 2022; Vo, Tu, Lin, Chiu, & Huang, 2024). However, self-report measures have certain limitations, including response biases and inaccuracies. For example, a study by Hill et al. (2018) found that self-assessed items can be influenced by cognitive impairments across different situations, and emotional reactions may lead to varying interpretations and response biases in self-reported cognitive assessments among older adults. Additionally, the FRAIL scale questions regarding current weight and weight from one year ago can be challenging for older adults to recall accurately. Furthermore, questions related to chronic diseases, such as heart disease or respiratory conditions, may be difficult for older adults to answer due to the various types of these diseases, making it challenging to specify the exact condition. Therefore, caution should be considered when using it for assessment.

Table 2 FRAIL scale

Question	0 Point	1 Point
In the past 4 weeks, how often have you felt tired? 1 = all the time, 2 = almost all the time, 3 = sometimes, 4 = rarely, 5 = never	Sometimes or rarely or never	All the time Or almost all the time
When you walk up 10 steps of stairs by yourself without stopping and without using any aids, do you have any problems?	No	Yes
When you walk 300-400 meters on your own without stopping and without using any assistive devices, do you have any problems?	No	Yes
Has your doctor ever told you that you have any of the following diseases? ☐ Hypertension ☐ Diabetes	0-4 diseases	5-10 diseases

Question	0 Point	1 Point
☐ Cancer (excluding skin cancer)		
☐ Chronic pulmonary disease		
☐ Coronary artery disease		
☐ Heart attack		
☐ Asthma		
☐ Chest congestion due to coronary artery disease		
☐ Arthritis		
☐ Stroke		
☐ Kidney disease		
How much do you weigh now (weighed without shoes) = ... kilograms	weight loss < 5 %	weight loss ≥5%
How much did you weigh a year ago (weighed without shoes) = ... kilograms		

Evaluation criteria: If there are 3 or more points, it is considered frailty. (Bureau of Elderly Health, 2024b)

The Role of Public Health Nurses in Urban Areas among Frailty Screening and Assessment

Public health nurses in urban areas take an important role in preventing and assessing frailty in older adults. By fulfilling these roles, urban nurses make a significant contribution to the prevention and treatment of frailty in older adults, improving their quality of life and lowering healthcare costs. Their interventions include:

Risk Assessment and Monitoring: Using standardized tools such as the FRAIL scale, urban nurses screen and evaluate people aged 60 to 65 to promote healthy behaviors and avoid frailty risks. Given that many assessment tools rely on self-reported data, nurses must be knowledgeable and cautious in order to reduce bias during evaluations. After identifying frailty, they gather relevant information to provide appropriate advice and conduct regular follow-ups. This is especially important because many older adults in urban areas live alone, take multiple medications, or live in two-story homes, which increases their risk of falling and injury (Wills, 2023). Similarly, urban areas in Thailand share these risk factors; however, a significant proportion of older adults (49.8%) live with their spouse (Tupanich, Chaiyalap, & Chaiyalap, 2019).

Nutritional Promotion: Nurses advise older adults with frailty to consume adequate energy (approximately 21 kilocalories per kilogram of body weight per day) and essential proteins to support muscle development (Cruz-Jentoft, Kiesswetter, Drey, & Sieber, 2017). To prevent weight loss and weakness, recommended protein sources include eggs, fish, whole grains, milk, and soy milk (Lima, Costa, Rodrigues, Lameiras, & Botelho, 2022)

Physical Activity Encouragement: Regular exercise is important for preventing, delaying, or reducing the severity of frailty in older adults. Aerobic and balance exercises, such as Tai Chi or traditional Thai dance, improve muscle strength, walking speed, balance and endurance while also reducing fatigue (Kasim, Veldhuijzen van Zanten, & Aldred, 2020; Laophosri, Kanpittaya, Sawanyawisuth, Auvichayapat, & Janyacharoen, 2013).

Medication Safety: Urban nurses inform older adults about the potential side effects of polypharmacy, which can increase the risk of falls and physical decline. Their interventions include: (1) Health education and information to prevent exhaustion and other complications resulting from medication side effects. (2) Organizing medications by dose to ensure appropriate intake. (3) collaborating with physicians or pharmacists when older adults, caregivers, or families need help with medication management or experience side effects. (4) Encouraging communication among older adults, caregivers, and families in order to avoid errors and ensure consistent medication adherence.

Conclusion

Frailty is a common syndrome that increases with age, particularly in urban areas, where the highest population of older adults resides. Despite its prevalence, frailty is preventable and reversible with appropriate care aimed at preserving physical, cognitive, and nutritional capacities (Ng et al., 2015). Insights from studies suggest that tools like the FRAIL scale, with its five simple self-reported items, offer numerous advantages: accessibility, ease of use, and minimal time requirement (Rodríguez-Laso, Martín-Lesende, Sinclair, Sourdet, Tosato, & Rodríguez-Mañas, 2022). This makes it an ideal instrument for rapid frailty identification in urban community settings or geriatric care units, empowering urban nurses to play a crucial role in preventing and managing frailty among older adults.

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