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Cultural and Structural Gaps in Falls Prevention Programs for Community-Dwelling Elderly in Kerala: A Narrative Review

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Abstract

While numerous global exercise interventions have demonstrated efficacy in preventing falls among older adults, their direct application in Kerala's sociocultural context remains limited. The unique characteristics of Kerala's aging population call for an evaluation of gaps in the suitability and sustainability of existing programs.

To identify and critically analyze the cultural, logistical, psychological, and structural gaps in existing falls prevention programs, particularly in relation to their applicability to community-dwelling elderly in Kerala.

A narrative synthesis was conducted based on a scoping review and gap analysis embedded within the primary research. Thematic analysis and matrix mapping approaches were employed to align global intervention components against Kerala's contextual needs.

The review identified five major categories of gaps: cultural inappropriateness, lack of psychological focus, low feasibility, affordability constraints, and underrepresentation of Kerala's elderly in research. Programs like Otago, Tai Chi, and FaME were poorly suited to local dress codes, language barriers, and social environments. Moreover, most interventions neglected fear of falling, self-efficacy, or social isolation—critical issues in this demographic.

Bridging the disconnect between evidence-based practice and contextual realities in Kerala

requires culturally attuned, linguistically localized, and community-integrated interventions.

Kerala's demographic trends demand urgent, tailored solutions grounded in both global evidence and local cultural dynamics.

Introduction

Falls are a major contributor to morbidity, disability, and loss of independence among older adults. Globally, an estimated 37.3 million falls occur annually that are severe enough to require medical attention, with significant impacts on individuals' quality of life and health systems (World Health Organization [WHO], 2007). Older adults who fall are more likely to experience fractures, head injuries, and psychological distress, particularly fear of falling, which can further reduce their physical activity and increase social isolation (Delbaere et al., 2010). Beyond personal health, falls also place a substantial financial burden on healthcare systems worldwide.

In India, this issue is especially pressing in the state of Kerala, where demographic aging is occurring at an accelerated pace. According to the Government of Kerala (2022), over 16% of the population is aged 60 years and above, compared to the national average of around 10%. This demographic trend is driven by improved life expectancy, reduced fertility rates, and strong public health indicators. While Kerala is often praised for its literacy rates, decentralized health governance, and proactive welfare programs, its healthcare system has not adequately adapted to the specific needs of its growing elderly population, especially regarding fall prevention.

Internationally validated interventions such as the Otago Exercise Programme (Campbell et al., 1997), the FaME protocol (Skelton et al., 2005), and Tai Ji Quan: Moving for Better Balance (Li et al., 2005) have demonstrated effectiveness in reducing fall incidence through structured strength, balance, and flexibility training. However, these interventions are designed primarily for Western settings and assume certain baseline infrastructural, cultural, and socioeconomic conditions. Their direct transferability to Kerala is limited. Many programs require specialized

trainers, dedicated spaces, and equipment such as resistance bands, which may not be accessible or acceptable in Kerala's community or home-based contexts.

Additionally, cultural factors present unique barriers. For instance, traditional attire such as sarees and mundus restrict certain movements. Social norms may discourage older adults, particularly women, from participating in mixed-gender group exercises or physically strenuous activities in public. Literacy levels, although relatively high in Kerala, still vary significantly among the elderly, and health information is often delivered in English or overly technical Malayalam, making comprehension difficult (Thomas & Nair, 2021). Moreover, many homes have architectural features like tiled flooring, uneven thresholds, and squat toilets, all of which elevate fall risk and necessitate environment-specific adaptations (Menon & Sudhir, 2021).

Given these considerations, it becomes essential to critically assess how and to what extent global fall prevention strategies can be contextualized for Kerala. While some localized initiatives have emerged, there is limited literature synthesizing the cultural, infrastructural, and psychosocial factors that may affect the feasibility and success of these interventions in the state. Furthermore, Kerala's strong civil society and community-based platforms like Kudumbashree offer opportunities to co-develop and deliver culturally relevant interventions—yet these remain underutilized in fall prevention efforts.

This narrative review aims to bridge that gap by synthesizing global and Indian literature and applying a cultural and structural lens to assess their relevance for Kerala's community-dwelling elderly population. The paper identifies key areas where existing programs fall short and proposes directions for culturally sensitive, community-integrated fall prevention strategies suited to Kerala's socio-demographic realities.

Methodology

A narrative review methodology was employed. Literature searches were conducted using databases including PubMed, Scopus, Google Scholar, JSTOR, and Indian Citation Index. Search terms included “falls prevention,” “elderly,” “Kerala,” “cultural adaptation,” “community health,” “Otago,” “Tai Chi,” and “geriatrics India.” Literature published between 2000 and 2024 was considered. Grey literature, government reports, and WHO policy documents were also included.

Thematic content analysis was used to identify patterns related to cultural, logistical, and structural barriers to implementing fall prevention strategies. Data were organized under five major themes: cultural relevance, health system constraints, psychosocial dynamics, community engagement, and environmental barriers.

Results and Discussion

1. Cultural Relevance and Language

A critical limitation in applying Western-designed fall prevention programs in Kerala lies in their cultural incompatibility. Exercises such as lunges, squats, and floor-based routines may not be feasible or comfortable for elderly individuals wearing traditional Indian attire such as sarees and mundus. For example, women in rural Kerala may be discouraged from performing certain postures in public due to social modesty norms, especially in mixed-gender settings (Kaur, Kaur, & Kaur, 2017). Furthermore, religious and cultural beliefs may influence participation in structured physical activity. Many elders perceive exercise as a concept exclusive to younger generations or as a form of punishment rather than preventive health (Narayanasamy & Kalpana, 2020).

Language barriers further limit the accessibility of these programs. Instructional materials, including videos and pamphlets, are typically in English and often employ medical or technical terminology. In a recent community-based study, only 10% of Kerala’s elderly respondents expressed confidence in reading and understanding English health guides (Thomas & Nair, 2021). Even literate individuals preferred simple Malayalam explanations or visuals. Therefore, fall

prevention programs must incorporate translated materials, culturally appropriate visuals, and local idioms to enhance comprehension and participation (Gulati & Mehta, 2019).

Peer-led sessions and community ambassadors who speak the local dialect can also enhance comfort and reduce perceived hierarchy between the “trainer” and the elder participants. These adaptations ensure that elderly participants can relate to the program, which is essential for long-term adherence.

2. Health System Barriers

Kerala's public health system is primarily focused on communicable diseases, maternal and child health, and now, non-communicable diseases like diabetes and hypertension. Geriatric care, including fall prevention, remains fragmented and under-resourced (Indian Council of Medical Research [ICMR], 2019). Although the National Programme for Health Care of the Elderly (NPHCE) was launched to address this gap, it has encountered implementation issues such as inadequate human resources, poor intersectoral coordination, and limited monitoring mechanisms (Ministry of Health and Family Welfare [MoHFW], 2020).

At the ground level, ASHA workers and community health nurses play a pivotal role in reaching elderly populations. However, these frontline workers often lack training in assessing fall risk or delivering preventive exercise routines (Shaji & Varghese, 2020). Additionally, their existing workloads—often tied to maternal and child health—leave little scope for specialized geriatric engagement.

Kerala's decentralized health governance system through Local Self Governments (LSGs) presents both a challenge and an opportunity. While autonomy can facilitate community-specific innovation, the lack of a standardized fall prevention protocol results in inconsistent programming across districts (Kumar & Nair, 2021). Integrating falls prevention into LSG health budgets and training programs can address these gaps and promote equity in service delivery.

3. Psychosocial Dimensions

Fear of falling (FoF) is a recognized predictor of reduced physical activity, loss of independence, and poorer quality of life among older adults. In Kerala, FoF is further intensified by social stigma associated with frailty and aging (Zijlstra et al., 2007). A study by Rajan and Mishra (2018) showed that 35% of elderly respondents in urban Kerala limited outdoor mobility not due to physical incapacity, but due to fear and lack of confidence.

Social isolation, especially among women and elderly individuals living alone, is another contributing factor. Kerala's high rates of labor migration have resulted in many "left-behind" elders with minimal familial support (Zachariah & Rajan, 2012). This emotional disconnection can lead to depressive symptoms and reluctance to engage in group activities or preventive health behaviors.

To address these psychosocial barriers, fall prevention programs must integrate components such as motivational interviewing, positive reinforcement, and psychosocial education. Peer group engagement, as demonstrated in successful programs like Stepping On (Mahoney et al., 2007), can reduce fear and foster a sense of community ownership. Including modules on confidence building and fall coping strategies can help in mitigating psychological barriers and sustaining engagement.

4. Community Engagement and Support Structures

Kerala's civil society structure is a powerful but underutilized asset in the domain of fall prevention. The Kudumbashree mission, Ayalkootams (neighborhood groups), residents' welfare associations, and faith-based organizations are embedded deeply in local communities (George & Krishnan, 2019). Despite their widespread presence, these platforms are rarely integrated into formal health program delivery systems.

Community health programs that have successfully engaged such networks have shown higher adherence rates and sustainability. For instance, a project piloted in Kozhikode district

integrated fall prevention education into weekly women's group meetings, resulting in a 40% increase in self-reported balance practice among elders after three months (Balan & Mathew, 2021).

Training local community leaders, elderly peer mentors, and volunteers can help decentralize program delivery. Such an approach not only ensures cultural compatibility but also promotes social reinforcement. Community ownership increases the likelihood of continuity beyond the research or pilot phase.

Moreover, culturally resonant community events like temple festivals or local ayurvedic health camps can serve as venues for awareness generation about fall risks and prevention strategies (Kumar et al., 2020). These events are often attended by elderly individuals and can be leveraged for outreach without incurring additional infrastructure costs.

5. Environmental and Economic Constraints

Environmental factors specific to Kerala homes significantly contribute to fall risk. Common hazards include high door thresholds, wet and slippery floors, poor lighting, and staircases without railings (Menon & Sudhir, 2021). These challenges are often overlooked by fall prevention programs designed in Western contexts, which assume more accessible and standardized housing.

Simple environmental audits, such as the Home Falls and Accidents Screening Tool (Home FAST), can be adapted for Kerala and delivered by ASHA workers or family members (Vu et al., 2011). Modifications such as anti-skid mats, grab bars, and improved lighting can be promoted at low cost and with community support.

Economically, Kerala's elderly population includes many who are dependent on modest pensions, remittances, or support from children (KSPB, 2022). Out-of-pocket healthcare expenses

remain high despite subsidized public health services. A program demanding physiotherapy sessions, gym memberships, or expensive equipment is unrealistic for wide-scale adoption.

Instead, fall prevention should be embedded into existing public health activities such as wellness clinics or community yoga sessions. Low-cost tools—such as sandbags for strength training or locally produced walking aids—can be introduced in group sessions. Programs like Otago can be modified to eliminate equipment dependency while preserving core functional elements (Robertson et al., 2001).

Partnerships with NGOs, private philanthropists, or CSR initiatives may provide micro-funding for environmental modifications or exercise kits for at-risk elders in low-income households (Srinivasan & Joseph, 2018).

Conclusion

This narrative review underscores that while globally validated falls prevention programs offer strong evidence of effectiveness, their applicability in the Kerala context remains limited due to multiple cultural, infrastructural, and economic constraints. Interventions developed in Western contexts often overlook key factors such as traditional attire, home architecture, language diversity, and sociocultural norms prevalent among older adults in Kerala.

To address these gaps, there is an urgent need to develop Kerala-specific protocols that are linguistically accessible, culturally resonant, and financially feasible. Key recommendations include translating existing evidence-based exercise programs into Malayalam, ensuring they reflect daily functional movements appropriate for local dress and environments. Community groups such as Kudumbashree and Ayalkootams should be leveraged to support peer-led delivery models. Additionally, frontline health workers such as ASHA staff and community nurses must be trained in geriatric fall prevention strategies. Simple home-based fall risk assessments and cost-effective environmental modifications should also be incorporated.

Importantly, fall prevention initiatives must integrate psychosocial and motivational elements to reduce fear, build confidence, and encourage participation. Future research should focus on piloting these adapted models across diverse districts in Kerala and evaluating both their clinical effectiveness and long-term sustainability within public health systems.

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