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From Planning to Practice: Feasibility of Implementing the 'Capture the Fracture' Programme in A Malaysian Community Setting

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ABSTRACT

Background: Fragility fractures due to osteoporosis represent a significant health burden among Malaysia's ageing population. The 'Capture the Fracture' (CTF) programme is a global initiative promoting coordinated secondary fracture prevention. This study aimed to assess the feasibility of implementing a community-based adaptation of the CTF programme in a Malaysian community setting, focusing on the implementation process and perceived relevance among older adults.

Methods: This qualitative feasibility study was conducted to assess the implementation process of a community-based fracture prevention initiative at the Activity Centre for Older People (PAWE) in Maran, Pahang. Data collection involved direct observations of programme delivery, attendance monitoring, and semi-structured interviews with participants to evaluate their experiences, engagement levels, and perceived barriers and facilitators. Thematic analysis was conducted to explore participants' perspectives and implementation dynamics.

Results: Four key themes emerged: strong community engagement, improved awareness and understanding of osteoporosis, challenges in sustaining the programme due to access and follow-up issues, and the importance of local collaboration in fostering a supportive environment.

Conclusion: Adapting the CTF programme for a community setting in Malaysia is feasible and beneficial. It raises awareness and supports early identification of osteoporosis risk and prevention of fragility fractures among older adults, though integration with local health services is crucial for sustainability. Future research should examine follow-up models and the scalability of community-based interventions.

Keywords: Practice, Capture the fracture, Programme, Community setting

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INTRODUCTION

Malaysia is experiencing a demographic shift as its population grows older. It is estimated that Malaysia may become an ageing nation by 2030 with people aged 60 years and over surpassing 15% of the working population (1). Osteoporosis and fragility fractures are growing public health concerns in Malaysia, particularly among the ageing population (2). Fragility fractures, often resulting from minimal trauma such as a fall from standing height, contribute to increased morbidity, reduced quality of life, loss of independence, and substantial healthcare expenditure. These fractures frequently lead to hospitalisation, long-term rehabilitation, or permanent disability, creating a burden on the caregivers and the national healthcare system (3)

The Capture the Fracture (CTF) programme, initiated by the International Osteoporosis Foundation, is a secondary prevention designed to lower the risk of future fractures by ensuring coordinated post-fracture care (4). These typically involve multidisciplinary Fracture Liaison Services (FLS) that systematically identify, assess, treat, and monitor patients with fragility fractures (1). While these services are still limited even in tertiary hospitals and urban centres across Malaysia, they remain especially scarce and inaccessible to older adults in rural and semi-rural communities, highlighting the urgent need for wider implementation across all healthcare settings.

The CTF framework has yet to be extensively adopted at the community level, where older adults often encounter barriers such as limited transportation options, low health literacy, and insufficient awareness of osteoporosis. Consequently, many opportunities for early intervention and secondary prevention are overlooked. Community-based approaches that deliver services directly to these populations could provide a more accessible and equitable solution (5).

There is an evident and urgent need to implement the CTF programme more widely at the community level (6). Given the rapid growth of Malaysia's ageing population and the substantial burden of osteoporosis and fragility fractures, proactive grassroots interventions are vital to address current gaps in prevention and care. The CTF framework offers a well-validated, structured model that enhances public awareness, facilitates the early identification of individuals at risk, and supports timely intervention (5). Without such measures, preventable fractures will continue to impair mobility, independence, and quality of life for a significant proportion of older adults. Broad adoption of the CTF programme is therefore not only cost-effective but also a strategic investment in creating a more sustainable and responsive healthcare system that promotes healthy ageing and equitable access to bone health services across all communities (6).

This study explores the feasibility of delivering a CTF-aligned intervention in a community setting, leveraging partnerships with local centres such as PAWE and academic institutions. The primary aim was to determine whether this type of initiative could be delivered effectively, assess participant engagement, and explore their responses to the programme. The findings will help inform the development of future secondary fracture prevention strategies at the community level in Malaysia, with the overarching goal of improving accessibility and sustainability of bone health services for older adults.

METHODS

The qualitative feasibility study was designed to explore the implementation process of a community-based fracture prevention initiative. A one-day CTF programme was conducted to examine its suitability and integration within a real-world, community-based setting.

Setting and Participants

The study involved community-dwelling older adults who regularly attended PAWE for various health and spiritual activities. PAWE (Pusat Aktiviti Warga Emas) Maran is a government-supported activity centre serving older adults in Pahang, specifically at Felda Maran, Pahang. This centre provides health and wellness programmes, social support, and a central venue for community engagement. The majority of the community members who regularly attended PAWE participate in religious and spiritual activities at this centre, including religious talks, Quranic classes, kuliah dhuha, and other faith-based programmes.

Participants were recruited through PAWE's existing communication channels and PAWE's database through announcements during weekly gatherings. The inclusion criteria specified individuals aged 60 and above who were able to give informed consent. A total of 66 community-dwelling older adults attended this CTF programme.

Following the programme, purposive sampling was employed to identify participants for the semi-structured interviews. From the 66 older adults who attended the intervention, 20 were invited to participate in the semi-structured interviews. Participants were invited based on predefined inclusion criteria, which included willingness to participate, variation in gender, functional mobility, and prior awareness of osteoporosis. This approach was adopted to capture a diverse range of views and ensure a balanced representation of participant experiences. Purposive sampling was chosen as it enables the deliberate selection of information-rich participants who can provide meaningful insights into the implementation process and community acceptability of the intervention.

Programme Delivery and Direct Observations

The programme was conducted as a one-day event comprising three main components:

- Education sessions: Delivered by trained students and nursing faculty, covering osteoporosis, fall prevention, and nutrition for bone health.
- Fracture risk assessment: The WHO Fracture Risk Assessment (FRAX) tools were used to estimate 10-year fracture risk, along with simple functional mobility tests, such as the Time Up and Go (TUG), and fall risk assessment. Participants were counselled on their risk levels.
- Engagement activities: Included interactive question and answer session, distribution of brochures, and hands-on demonstrations (Physical exercise).

Data Collection

Data were gathered through direct observation of programme delivery, attendance monitoring, and Semi-structured interviews were conducted the day after the intervention, following the completion of the post-programme evaluation, to explore participants' experiences and perceptions in greater depth. Researchers systematically recorded logistical considerations, including the timing and sequencing of activities, participant attendance and active involvement, as well as the quality of interactions between facilitators and participants. The interview sessions were guided by a semi-structured interview designed to explore participants' perceptions of the programme, its feasibility, and any barriers or facilitators to participation. Each interview session was conducted in a quiet, comfortable area at the PAWE centre to encourage openness and engagement. Each interview lasted approximately 30–45 minutes, was audio-recorded with consent, and supplemented by detailed field notes taken by the researcher. The interviews were conducted by trained researchers who were fluent in the local language and sensitive to cultural nuances, thereby facilitating effective communication and fostering rapport with participants.

Data Saturation

Data collection continued until thematic saturation was achieved, indicated by the absence of new themes or concepts emerging from the later semi-structured interviews. In total, 20 interviews were conducted with a purposively selected subgroup of older adults who had attended the intervention, ensuring diverse representation across age, gender, and mobility. Given the rich, focused discussions and the recurrence of similar points across participants, it was determined that further data collection was unlikely to yield additional meaningful insights. Achieving saturation supported the rigour and trustworthiness of the findings and ensured that the themes fully reflected the range of participant experiences.

Data Analysis

The interviews were transcribed verbatim and checked for accuracy. The transcripts were then checked for completeness against the original recordings and anonymised before analysis. A thematic analysis was conducted following the six-step process outlined by Braun and Clarke (2006)(7). First, the research team familiarised themselves with the data by

reading and re-reading the transcripts. Second, initial codes were generated manually across the dataset, identifying segments of text that were relevant to the research aims. Two researchers independently familiarised themselves with the transcripts before generating initial codes. These codes were reviewed and refined collaboratively to identify potential themes. Themes were then examined to the research aims to ensure they accurately reflected participant views and the feasibility of programme implementation. Third, the codes were collated into potential themes that reflected common patterns related to implementation feasibility, participant perceptions, and any facilitators or barriers discussed. Fourth, these themes were reviewed and refined collaboratively by the research team to ensure that they accurately captured the data. Fifth, themes were defined and named clearly to describe their core meaning. Finally, the findings were synthesised into a coherent narrative supported by illustrative participant quotations. Throughout the process, regular team meetings were held to enhance reflexivity and consensus on the final themes, thereby ensuring rigour and credibility in the analysis.

RESULTS

Findings in this section are derived from the direct observation of programme delivery, attendance monitoring, and thematic analysis of semi-structured interviews conducted with older adults who participated in the community-based fracture prevention programme at PAWE Maran. The interviewees (n = 20) were aged between 62 and 78 years, with the majority being female (15 women and 5 men), and all were of Malay ethnicity. Most lived within close proximity to the PAWE centre and regularly participated in its community and religious activities. The interviews explored participants' experiences, perceptions of the programme, and the barriers and enablers they encountered. Four key themes emerged from the analysis: community readiness and interest, awareness and knowledge gains, access and follow-up barriers, and the value of local collaboration.

Community Readiness and Interest

Observational findings indicated a high level of participant engagement throughout the programme. The sessions were conducted according to the planned structure, with minimal disruptions. Observers noted that participants were attentive, actively participated in educational activities, and responded positively during interactive discussions. The smooth delivery of the intervention suggested that the programme was well-received and logistically feasible within the community setting.

Attendance records showed a strong turnout, with 66 older adults participating in the one-day event. Most attendees remained for the full duration of the programme, suggesting sustained interest and receptiveness to the content delivered. These findings from direct observation and attendance monitoring further support the practicality of implementing such interventions in familiar community venues.

Participants demonstrated a high level of interest and engagement, as evidenced by the substantial turnout and their active participation during the programme. Participants attributed their willingness to participate to the programme being held at PAWE, a well-known and easily accessible community venue that they attended regularly for social, religious, and educational activities.

"I already come to PAWE for religious and leisure activities, so when there's a health programme like this, I want to join."

(P1)

Participants' willingness to engage in the programme was closely associated with the use of a familiar and accessible venue. Holding the sessions at a centre they already attended regularly appeared to reduce practical and psychological barriers, such as the need to travel or navigate unfamiliar spaces. This sense of ease and familiarity contributed to higher levels of interest and participation, suggesting that the choice of setting played a significant role in facilitating community engagement. The findings highlight the value of delivering health initiatives in local venues that are already embedded in the daily routines of the target population, thereby improving accessibility and encouraging sustained involvement.

"This programme is good because we don't have to travel far to the hospital. If it's held here, more people can come."

(P2)

These further underscores the importance of accessibility and convenience in facilitating participation, particularly among older adults who may encounter mobility limitations or face transportation-related challenges.

"My friends and I have been looking forward to a programme like this because we rarely have the chance to learn new things here."

(P3)

The participant's remarks underscore a strong interest in acquiring new knowledge, suggesting that the programme was meeting an existing demand for accessible health education within the community. Beyond simply encouraging attendance, this eagerness reflects the programme's capacity to address a previously unmet need for ongoing learning among older adults. It also implies that delivering educational content in a familiar, community-centred setting may enhance engagement and empower participants to make more informed decisions about their health. These findings highlight the importance of incorporating tailored educational components into similar initiatives, particularly in resource-limited or underserved communities where opportunities for health-related learning may otherwise be scarce.

Awareness and Knowledge Gains

The sessions effectively enhanced participants' understanding of osteoporosis, including its associated risks and evidence-based prevention strategies. Prior to the programme, most participants demonstrated limited awareness of their individual fracture risk, suggesting a substantial knowledge gap in the community. The intervention, therefore, played a critical role in improving health literacy around bone health and empowering participants to recognise modifiable risk factors and adopt appropriate preventive measures.

"I just learned that my bones can become brittle even though I look healthy and active."

(P10)

"Before this, I thought that if I had no pain, my bones were fine. Now I know I need to check and prevent early".

(P4)

Participants also indicated that they intended to incorporate the advice provided into their daily routines, suggesting a commitment to applying the knowledge gained to support their bone health and reduce future fracture risk.

"The talk and questionnaire gave me a lot of useful information to apply, like increasing my calcium and being more careful when walking".

(P5)

Access and Follow-Up Barriers

Despite their generally positive perceptions of the programme, participants highlighted a range of practical challenges that could limit sustained engagement. Notably, difficulties related to transportation and mobility emerged as significant concerns, with some individuals indicating that travelling to and from the centre could be challenging. These constraints not only affected their ability to participate regularly but also underscore the need to consider logistical support when designing and implementing community-based health initiatives targeted at older adults. Addressing these barriers is therefore critical to enhancing programme accessibility, encouraging continued involvement, and ensuring the long-term success of similar interventions. One participant remarked:

"It's hard to go to the clinic because I depend on my children to drive me. If follow-up services were here, it would be easier."

(P12)

Several participants indicated that they typically travelled to the centre independently, either walking, using motorcycles, or coming along with neighbours and friends, because of its proximity to their homes and its familiarity as a daily or weekly gathering space. Another noted:

"I'm worried because I'm not sure what to do after this programme. If a nurse could come to PAWE once in a while, that would be better."

(P15)

Participants also acknowledged that these difficulties were common among their peers, as one explained:

"Many here have trouble travelling long distances or arranging transport. That's the main challenge if we need to go to the hospital."

(P11)

In addition, some participants noted a discrepancy between their expectations and the scope of the services provided. Several indicated that they had anticipated a direct bone density test during the programme rather than a questionnaire-based assessment. One participant remarked:

"I thought they would do a proper bone density check, but in the end they just asked questions."

(P16)

This highlights a potential barrier to engagement, as unmet expectations may influence participants' satisfaction with the programme and their willingness to pursue follow-up assessments or interventions.

Value of Local Collaboration

Participants highlighted the welcoming environment created by the student volunteers and faculty members, which facilitated learning and fostered trust. One participant remarked:

"I felt more comfortable talking to the students and lecturers because they were friendly and tolerant with our questions."

(P17)

Another stated:

"When the programme is held here and supported by people we know, I feel more confident and not shy to ask questions."

(P19)

Participants also appreciated the collaborative effort, as one noted:

"The collaboration between PAWE and the university seems very good. We hope they do more of these programmes because it's easy for us to attend."

(P13)

DISCUSSION

Community Readiness and Engagement

The strong turnout and active engagement indicate that PAWE, as a familiar and accessible venue, plays a central role in mobilising older adults. This supports earlier evidence that interventions integrated into existing community spaces are more effective at reaching those who might not otherwise engage with hospital-based services(8). Familiarity with the centre and its social networks appears to enhance trust and interest, which is vital for sustained participation. Given that social and religious gatherings are a regular feature of PAWE's schedule, embedding health education within this context created an informal and supportive environment (9) that facilitated learning and dialogue.

Beyond the influence of place and social familiarity, participants also demonstrated a positive awareness of the realities of ageing and the associated health risks, particularly about bone health. Many expressed concerns about their physical vulnerability, recognising that increasing age comes with a higher likelihood of falls and fractures. This personal awareness appeared to act as a strong motivator for engagement, as participants were eager to understand their risk factors and explore strategies to maintain independence and mobility. The alignment between the programme's focus and participants' self-perceived health priorities reflects the value of interventions that speak directly to the lived experiences and concerns of older adults (10).

Furthermore, delivering the programme in a relaxed and socially supportive setting allowed for an inclusive and empowering learning experience (11). Participants were encouraged to ask questions, reflect on their practices, and share experiences with peers, all within a context that was non-threatening and culturally appropriate. This approach not only enhanced knowledge retention but also strengthened social cohesion and mutual encouragement. Programmes that are both contextually relevant and empathetically delivered have the potential to foster long-term engagement, build trust, and support healthier ageing within the community (9).

Improved Awareness and Perceived Benefit

The programme successfully increased participants' awareness of osteoporosis and fracture risk factors. These findings align with previous community-based studies indicating that targeted health education can significantly enhance knowledge among older adults and encourage early intervention (12). Participants reported that they had previously been unaware of their susceptibility to osteoporosis and appreciated learning about preventive measures. The focus on modifiable risk factors such as diet, physical activity, and fall prevention was particularly impactful, as it provided them with practical strategies to manage their health. The remarks made by several participants about looking forward to "programmes like this" underscore a latent demand for accessible, context-appropriate health information, especially on topics that are often neglected in routine care.

Importantly, the educational sessions helped demystify osteoporosis as a "silent" condition, which is frequently overlooked due to its asymptomatic progression until a fracture occurs (13). This reflects the value of community-based interventions not only in increasing awareness but also in reframing osteoporosis from a distant or irrelevant concern to an immediate and personal health issue (14).

Additionally, participants' willingness to engage with the information presented and apply it to their daily lives highlights the importance of health literacy in supporting behaviour change (15). This proactive response reinforces the programme's potential to promote self-efficacy, particularly when health messages are delivered in a culturally sensitive and age-appropriate format. In this regard, the combination of clear messaging, trusted facilitators, and a familiar community setting contributed to a supportive learning environment that encouraged both comprehension and commitment to action.

Barriers to Access and Follow-Up

Despite the overall positive reception, the study revealed several barriers that must be addressed to optimise future implementation of community-based fracture prevention initiatives. Participants highlighted practical concerns such as limited mobility, dependence on family members for transportation, and the logistical difficulties of travelling to distant health facilities. Limited availability of transport options makes it difficult to access health facilities, resulting in fewer visits and heightened health risks (16). These issues are particularly relevant for older adults in semi-rural areas, where public transport options are limited and personal vehicles may not be available. Holding the programme at PAWE was seen as an advantage due to its accessibility; however, participants voiced concerns about their ability to attend follow-up services located elsewhere. This underscores the importance of continuity of care and the need to design interventions that minimise logistical demands on older adults.

In addition to mobility-related challenges, the study also revealed a disconnect between participants' expectations and the scope of the services provided. Some individuals anticipated a full diagnostic evaluation, including direct bone density testing, and expressed disappointment upon learning that only a risk assessment using the WHO FRAX tool would be offered. This is consistent with findings from similar community-based health initiatives, where the absence of tangible diagnostic procedures has led to feelings of dissatisfaction or perceived lack of value (17). To manage such expectations, it is essential to provide clear and transparent communication during the recruitment and registration phases.

To bridge the gap between expectations and available services, future iterations of the programme could consider incorporating basic diagnostic tools that are suitable for use in community settings. Portable technologies such as calcaneal quantitative ultrasound (QUS) devices offer a low-cost, non-invasive means of assessing bone health and may enhance the credibility and perceived impact of the programme (18). The introduction of such tools could not only increase participant satisfaction but also facilitate earlier identification of individuals at high risk, prompting timely referrals to formal healthcare services.

Value of Community-Academic Partnerships

The collaborative model adopted in this initiative served as a central enabler of its feasibility and acceptability. This partnership

facilitated a welcoming and inclusive environment that was both logistically organised and culturally attuned, enhancing community trust and receptivity. Such observations highlight the effectiveness of embedding health interventions within existing community structures through local partnerships (19).

Trust is fostered through authentic, transparent communication, mutual respect, power-sharing, and ongoing engagement, which are especially important when addressing historical injustices and skepticism among marginalized populations (20). In this case, PAWE's established role as a trusted venue for social, religious, and wellness activities enabled the health programme to be integrated seamlessly.

Furthermore, the active involvement of university students fostered a dynamic, intergenerational learning atmosphere. For students, the experience provided opportunities for service-learning, clinical exposure, and community engagement, all of which are vital for nurturing socially responsible healthcare professionals. For older adults, the presence of young, enthusiastic facilitators was both energising and affirming, breaking down generational divides and fostering mutual respect (21). As such, community–academic partnerships not only enhance the impact of individual programmes but also contribute to building sustainable systems of preventive care at the local level.

Implications for Policy and Practice

Findings from this study highlight the need for policies that support the decentralisation of secondary fracture prevention services, especially in the context of Malaysia's rapidly ageing population. Centralised, hospital-based Fracture Liaison Services (FLS) are often inaccessible to those living in rural and semi-rural areas, underscoring the urgency for a more equitable, community-centred approach. In Malaysia, where FLS implementation remains limited (22), there is a pressing need to initiate and expand such services as part of a national strategy for secondary fracture prevention.

Integration of community-based screening initiatives into primary healthcare referral pathways represents another critical step forward (9). Participants in this study expressed willingness to act on risk information when provided with accessible follow-up options. In addition, employing portable diagnostic tools such as quantitative ultrasound (QUS) devices can enhance credibility and convenience, encouraging sustained engagement and supporting earlier clinical decision-making. Developing clear referral guidelines and communication channels between community partners and health providers will be essential for ensuring continuity of care (19).

Furthermore, the feasibility and acceptability of this initiative lend support to the recent national push for broader community engagement in osteoporosis prevention. The Ministry of Health's clinical guidelines advocate for population-level awareness, early identification, and lifestyle interventions for all, which can be effectively delivered through community-based programming (23). Moving forward, public health strategies should prioritise funding, training, and inter-agency collaboration to support scalable models of community-based secondary fracture prevention. Doing so will not only address current care gaps but also build a more inclusive and responsive health system capable of meeting the needs of Malaysia's ageing society.

CONCLUSIONS

This feasibility study supports the value of community-driven osteoporosis prevention initiatives aligned with the Capture the Fracture framework among community-dwelling older adults. The programme demonstrated good acceptability and engagement, suggesting that scaling up such initiatives could reduce the burden of fragility fractures.

Older adults appreciated receiving health information in a familiar setting and were open to screening and follow-up. However, sustainability challenges persist, including limited capacity for follow-up, a need for trained personnel, and the need for coordination with local health systems. Recommendations include integrating such a programme with a community health clinic, developing mobile services, and involving community health workers. Future implementations should focus on enhancing

continuity of care and incorporating digital tools for follow-up and referral tracking. To ensure long-term success, integration with national public health programmes and policy-level support is essential. A decentralised, community-based approach to secondary fracture prevention has the potential to address care gaps and improve outcomes for Malaysia's ageing population.

LIMITATIONS

This study involved a small, single-site sample, which limits the generalisability of the findings. Moreover, data were collected via semi-structured interview discussions that may introduce social desirability bias. Exploration of long-term follow-up and referral uptake would also add to the understanding of programme impact. Finally, further refinement of the intervention, potentially incorporating bone densitometry and partnerships with local health clinics, may improve participant satisfaction and enhance clinical utility.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this paper. No financial, institutional, or personal relationships influenced the design, implementation, analysis or reporting of this research.

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AUTHORS CONTRIBUTION STATEMENT

NNIA: Led the overall project administration and was actively involved in both data collection and formal analysis.
NNKNMH: Contributed to the investigation and participated in the formal analysis.
MKZHF: Contributed to the investigation and participated in the formal analysis.
MKCH: Contributed to the investigation and participated in the formal analysis.
SNIJ: Contributed to the investigation and participated in the formal analysis.
NC: Responsible for the original draft preparation.

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