

Conceptual Integration of Social Cognitive and Self-Determination Theories in Promoting Physical Activity Among Pre-Frail Older Adults: A Narrative Review

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ABSTRACT

Background: Physical inactivity among pre-frail older adults contributes to accelerated progression toward frailty, disability, and mortality. Given the influence of psychological and motivational barriers, behavioural theories offer valuable insights into initiating and sustaining physical activity (PA). Social Cognitive Theory (SCT) highlights cognitive regulators such as self-efficacy, outcome expectations, goal setting, and behavioural reinforcement, while Self-Determination Theory (SDT) emphasises motivation driven by autonomy, competence, and relatedness. Integrating both perspectives may provide a more comprehensive foundation for designing effective PA interventions for pre-frail populations. **Methods:** A narrative review was conducted using literature retrieved from PubMed, Scopus, and Google Scholar. Searches were conducted for English-language publications from 2000 to 2025 using keywords related to “pre-frailty,” “older adults,” “physical activity,” “exercise,” “Social Cognitive Theory,” “self-efficacy,” “Self-Determination Theory,” “autonomy,” “competence,” “relatedness,” and “motivation.” Publications were included if they examined SCT, SDT, or related behavioural and motivational constructs in relation to PA among older adults, particularly those relevant to pre-frailty. Publications were excluded if they were unrelated to older adults, PA behaviour, or theory-informed intervention development. A total of 19 key publications were included in the final narrative synthesis. **Results:** SCT-based approaches may support PA initiation by enhancing self-efficacy, encouraging goal setting, strengthening self-regulation, and reinforcing perceived health benefits. Meanwhile, SDT-based approaches support long-term adherence by strengthening autonomous motivation, competence, emotional well-being, and social connectedness. Evidence suggests that interventions combining SCT and SDT constructs may improve adherence, resilience, psychological well-being, and overall quality of life among older adults. However, current evidence remains limited by the lack of longitudinal and culturally contextualised studies, particularly in Southeast Asia, restricting broader applicability to pre-frail populations.

Conclusion: Integrating SCT and SDT may provide a synergistic behavioural framework capable of addressing both external and internal determinants of PA participation in pre-frail older adults. To advance healthy ageing strategies, future research should develop hybrid, community-based interventions tailored to cultural and social contexts, particularly within Malaysian ageing populations. Strengthening both behavioural capability and motivational quality may optimise resilience and support sustained active ageing trajectories.

Keywords:

Social Cognitive ; Self-Determination Theory; Physical Activity; Pre-Frail

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INTRODUCTION

Physical inactivity remains a major public health concern among older adults, particularly those in the pre-frail stage. Pre-frailty is a potentially reversible condition that affects approximately 35–60% of community-dwelling older adults in Asia, with a prevalence of 41.6% reported among urban Malaysian populations (Norazman et al., 2020). Given its association with functional decline and adverse health outcomes, early theory-informed strategies are needed to promote physical activity and prevent frailty progression.

Behavioural theories provide valuable frameworks for understanding physical activity behaviour. Social Cognitive

Theory (SCT) emphasises self-efficacy, goal setting, outcome expectations, and self-regulation as key determinants of behavioural initiation (McAuley et al., 2007). In contrast, Self-Determination Theory (SDT) focuses on autonomy, competence, relatedness, and motivational quality, which are important for sustaining long-term engagement in physical activity (Deci & Ryan, 2000; Teixeira et al., 2022). Although both theories have been widely applied in physical activity research, their integrated application among pre-frail older adults remains insufficiently explored.

The integration of SCT and SDT is particularly relevant for pre-frail older adults, who often experience both physical and motivational barriers to physical activity. SCT-based

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strategies may facilitate behavioural activation, whereas SDT-informed approaches may enhance long-term adherence. Together, these theories offer a complementary framework for addressing both the initiation and maintenance of physical activity behaviour.

In Malaysia, physical activity participation among older adults is influenced by environmental, social, and cultural factors (Alias et al., 2022; Tan et al., 2018). Regional evidence further highlights the importance of self-efficacy, social support, accessibility, and motivation in shaping physical activity behaviour among physically vulnerable populations (Manaf et al., 2021; Hisham et al., 2022).

Therefore, this narrative review aims to conceptually integrate SCT and SDT to explain how physical activity can be initiated and sustained among pre-frail older adults. By synthesising evidence from global and Malaysian perspectives, this review proposes an integrated SCT–SDT pathway that links behavioural activation with motivational maintenance and provides a foundation for culturally responsive physical activity interventions.

MATERIALS AND METHODS

Study Design and Conceptual Approach

This study employed a theory-driven narrative review to synthesise evidence on Social Cognitive Theory (SCT) and Self-Determination Theory (SDT) in promoting physical activity among pre-frail older adults. A narrative review approach was chosen to conceptually integrate theoretical constructs and explore how SCT and SDT may complement one another in explaining physical activity initiation and long-term adherence across diverse literature sources.

Search Strategy and Data Sources

A structured literature search was conducted using PubMed, Scopus, and Google Scholar to identify relevant English-language publications published between 2000 and 2025. Search terms included keywords related to pre-frailty, older adults, physical activity, SCT, SDT, self-efficacy, motivation, autonomy, competence, and relatedness. Relevant Malaysian and regional studies were also considered when they provided contextual evidence related to physical activity participation and adherence.

Eligibility Criteria

Publications were included if they examined SCT, SDT, or related behavioural and motivational constructs in relation to physical activity among older adults. Empirical studies, intervention studies, qualitative studies, theoretical papers, and review articles relevant to theory-informed physical activity promotion were considered. Publications

unrelated to older adults, physical activity behaviour, or behavioural theory integration were excluded.

Study Selection Process

Titles, abstracts, and full texts were screened for relevance to physical activity, pre-frailty, SCT, and SDT. A total of 19 publications met the eligibility criteria and were included in the final narrative synthesis. The selection process is summarised in Figure 1.

Conceptual Extraction and Synthesis

Included publications were examined for recurring theoretical constructs, behavioural mechanisms, motivational processes, and practical implications related to physical activity promotion among pre-frail older adults. Particular attention was given to SCT constructs (e.g., self-efficacy, outcome expectations, and self-regulation) and SDT constructs (e.g., autonomy, competence, relatedness, and intrinsic motivation). Publications were evaluated based on their conceptual relevance and contribution to SCT–SDT integration.

Framework Development Procedure

Synthesised themes were used to develop a conceptual integration of SCT and SDT. SCT was positioned as supporting the initiation of physical activity through confidence-building, goal setting, feedback, and behavioural reinforcement, whereas SDT was positioned as supporting long-term adherence through autonomy, competence, relatedness, and internalised motivation. The integrated framework therefore explains how behavioural capability and motivational quality may interact to promote sustained physical activity among pre-frail older adults.

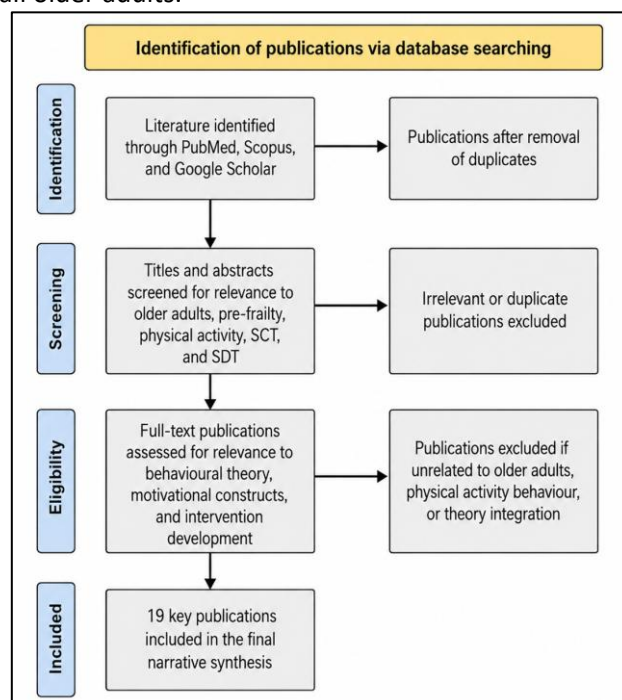


Figure 1. Simplified PRISMA-guided flow diagram illustrating the selection of publications for narrative review

RESULT

Overview of Theoretical Models

This section outlines how Social Cognitive Theory (SCT) and Self-Determination Theory (SDT) explain physical activity behaviour among pre-frail older adults and inform intervention development. SCT primarily explains behaviour initiation through confidence-building, behavioural capability, and self-regulation, whereas SDT focuses on sustaining behaviour through motivation and psychological need satisfaction.

Social Cognitive Theory, developed by Bandura, proposes that behaviour results from the interaction between personal, behavioural, and environmental factors (McAuley et al., 2007). Key SCT constructs relevant to physical activity include self-efficacy, outcome expectations, self-regulation, observational learning, reinforcement, and environmental support. Together, these factors may enhance confidence, perceived benefits, and behavioural skills, helping older adults overcome barriers to physical activity participation (Conn et al., 2014; Umstattd et al., 2008). Figure 2 illustrates the SCT constructs relevant to physical activity initiation among pre-frail older adults.

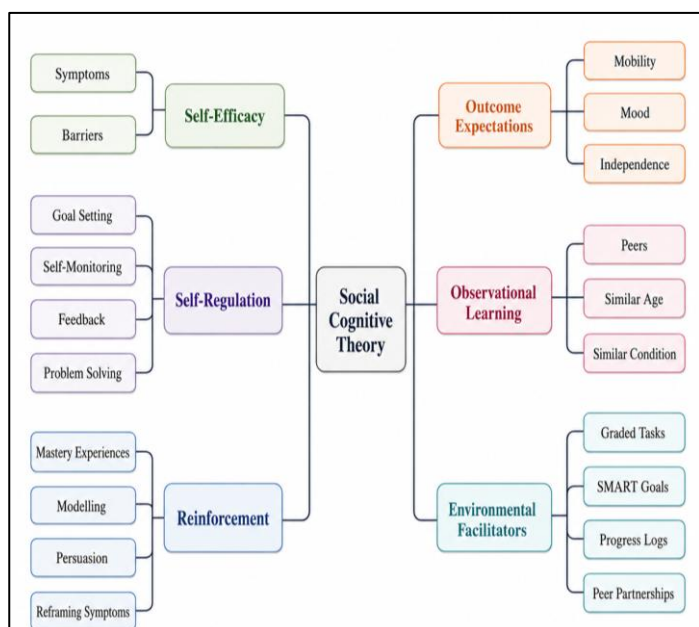


Figure 2. Social Cognitive Theory

In pre-frail populations, SCT-based strategies such as goal setting, self-monitoring, peer modelling, graded activities, and positive feedback may strengthen self-efficacy and

support early behavioural activation. However, additional motivational mechanisms may be required to sustain long-term adherence.

Self-Determination Theory (SDT), proposed by Deci and Ryan (2000), emphasises the quality of motivation through the satisfaction of three psychological needs: autonomy, competence, and relatedness. Fulfilment of these needs promotes autonomous motivation, whereby physical activity becomes personally meaningful and self-endorsed (Ng et al., 2012). Figure 3 presents the SDT cycle relevant to physical activity maintenance among pre-frail older adults.



Figure 3. The Self-Determination Theory Cycle

For pre-frail older adults, SDT highlights the importance of providing meaningful choices, achievable progression, supportive feedback, and opportunities for social connection. Strategies such as co-created activity plans, group-based activities, and motivational interviewing may strengthen long-term adherence by aligning physical activity with personal goals (Cotter et al., 2024).

Although both theories emphasise self-regulation and supportive environments, they differ in focus. SCT primarily supports behaviour initiation through confidence-building and behavioural skills, whereas SDT facilitates maintenance through motivational quality and psychological need satisfaction (Teixeira et al., 2022). Integrating both theories therefore offers a comprehensive framework in which SCT-based strategies initiate physical activity and SDT-based approaches sustain long-term engagement. This integration may be particularly beneficial for pre-frail older adults, who often require both structured support and motivational reinforcement to maintain active lifestyles (Si et al., 2024; Larsen et al., 2021; Hamid et al., 2018; Zainudin et al., 2020).

Application in Older Adult Physical Activity

Social Cognitive Theory (SCT) and Self-Determination Theory (SDT) have been widely applied in studies examining physical activity among older adults, including pre-frail populations. SCT primarily explains behaviour initiation through constructs such as self-efficacy, outcome expectations, goal setting, and self-regulation, whereas SDT focuses on sustaining behaviour through autonomy, competence, relatedness, and intrinsic motivation.

Evidence supporting SCT indicates that self-efficacy is a key determinant of physical activity participation. McAuley et al. (2007) reported that higher exercise self-efficacy was associated with greater goal-setting and persistence, while Yu et al. (2025) found that self-efficacy and outcome expectations were the strongest predictors of exercise behaviour among frail older adults. These findings suggest that confidence and perceived benefits are critical during the early stages of behaviour change.

SDT-based approaches contribute to long-term adherence by promoting autonomous motivation. Studies have shown that interventions incorporating autonomy support, competence building, and social connectedness improve physical activity engagement, quality of life, and adherence among older adults (Si et al., 2024; Cotter et al., 2024). Such findings indicate that sustained participation is more likely when physical activity aligns with personal values and psychological needs.

Research integrating SCT and SDT demonstrates complementary benefits. For example, Larsen et al. (2021) showed that combining motivational interviewing with activity-monitoring strategies improved movement, self-efficacy, and adherence among older adults. Together, these theories suggest that SCT-based strategies may facilitate behaviour initiation, while SDT-based approaches support long-term maintenance.

For pre-frail older adults, practical interventions may combine goal setting, self-monitoring, feedback, and peer modelling with autonomy-supportive strategies, social connectedness, and motivational interviewing. Such an integrated approach provides a structured pathway for increasing physical activity participation and sustaining engagement over time.

Overall, SCT explains the cognitive mechanisms underlying behaviour initiation, whereas SDT explains the

motivational processes that maintain behaviour. Integrating both theories offers a comprehensive framework for promoting sustained physical activity and healthy ageing among pre-frail older adults.

Critical Appraisal of Included Evidence

The included publications provide valuable theoretical and empirical support for integrating Social Cognitive Theory (SCT) and Self-Determination Theory (SDT) in promoting physical activity among older adults. The literature encompasses diverse study designs, including theoretical papers, qualitative studies, cross-sectional studies, intervention trials, protocols, and review articles. While this diversity enriches conceptual understanding from multiple perspectives, it limits direct comparison due to variations in populations, intervention approaches, outcome measures, and follow-up periods.

A major strength of the evidence is the consistent identification of self-efficacy, goal setting, autonomy, competence, relatedness, and social support as key determinants of physical activity behaviour (McAuley et al., 2007; Ng et al., 2012; Teixeira et al., 2022). Intervention studies further demonstrate that behavioural and motivational strategies can enhance adherence, confidence, and quality of life (Larsen et al., 2021; Si et al., 2024). Malaysian and regional studies also provide useful contextual insights into barriers and facilitators of physical activity among physically vulnerable populations (Manaf et al., 2021; Hisham et al., 2022a, 2022b; Ong et al., 2024).

However, several limitations remain. Many studies involve general older adult populations rather than specifically pre-frail individuals. Some Malaysian studies were conducted among people with spinal cord injury or physical disabilities and were therefore included only as contextual evidence. In addition, the evidence base varies in methodological strength. Cross-sectional studies cannot establish causality, qualitative studies may have limited generalisability, and intervention studies often involve short follow-up periods and heterogeneous designs. Furthermore, culturally contextualised evidence from Malaysia and Southeast Asia remains limited.

Overall, current evidence supports the conceptual relevance of SCT–SDT integration, but further longitudinal and theory-driven intervention studies involving clearly defined pre-frail populations are needed to evaluate its effectiveness in promoting sustained physical activity and improving health outcomes.

DISCUSSION

Synthesis and Comparative Analysis

Social Cognitive Theory (SCT) and Self-Determination Theory (SDT) offer complementary perspectives for understanding physical activity behaviour among pre-frail older adults. While SCT emphasises behavioural initiation through self-efficacy, outcome expectations, self-regulation, and reinforcement, SDT focuses on sustaining behaviour through autonomy, competence, relatedness, and intrinsic motivation (Deci & Ryan, 2000; McAuley et al., 2007; Ng et al., 2012). Integrating both theories therefore provides a comprehensive framework that addresses both the initiation and maintenance of physical activity.

Evidence supports this theoretical complementarity. Studies have shown that autonomy-supportive approaches combined with behavioural strategies such as self-monitoring, feedback, and activity tracking improve physical activity participation, self-efficacy, and adherence among older adults (Larsen et al., 2021; Si et al., 2024; Cotter et al., 2024). These findings suggest that SCT-based constructs may facilitate behavioural activation, whereas SDT-based constructs support long-term engagement through internalised motivation and psychological need satisfaction.

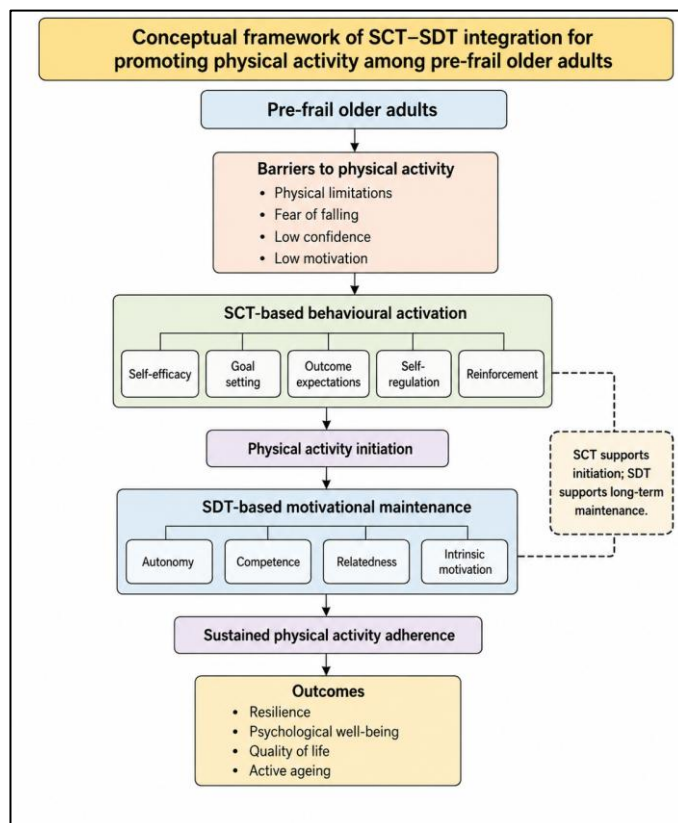
Based on the reviewed evidence, SCT and SDT can be conceptualised as sequential and complementary mechanisms. SCT constructs, including self-efficacy, goal setting, outcome expectations, and self-regulation, may support early participation in physical activity, while SDT constructs, including autonomy, competence, relatedness, and intrinsic motivation, may enhance long-term adherence. This integrated SCT–SDT pathway provides a theoretical basis for developing interventions that combine structured behavioural support with motivational maintenance. The proposed SCT–SDT integration pathway is illustrated in Figure 4.

The proposed framework is particularly relevant for pre-frail older adults, who may require external guidance and confidence-building to initiate physical activity before gradually transitioning towards more autonomous and self-directed engagement. Such an approach may help address common barriers such as fear of falling, low confidence, and uncertainty regarding exercise participation.

Nevertheless, the evidence base remains limited. Much of the literature is derived from general older adult or rehabilitation populations rather than clearly defined pre-

frail samples. In addition, SCT-focused studies often place less emphasis on motivational quality, whereas SDT-based studies may provide less guidance on structured behavioural techniques required during the initiation phase. Further empirical research is therefore needed to evaluate integrated SCT–SDT interventions specifically among pre-frail older adults.

Figure 4. Conceptual framework of SCT–SDT intergration for promoting physical activity among pre-frail older adults



Cultural adaptation may further strengthen this framework. In collectivist contexts such as Malaysia, family involvement, social support, and community participation may enhance both behavioural and motivational processes (Hamid et al., 2018; Zainudin et al., 2020). Incorporating culturally relevant and community-based approaches may therefore improve the effectiveness of theory-informed physical activity interventions.

Overall, SCT and SDT should be viewed as complementary rather than competing theories. Their integration offers a practical and theoretically grounded framework for promoting sustained physical activity among pre-frail older adults and provides direction for future intervention development and evaluation.

Implications for Practice

Integrating Social Cognitive Theory (SCT) and Self-Determination Theory (SDT) provides a practical

framework for promoting physical activity among pre-frail older adults. SCT may support behaviour initiation through self-efficacy, goal setting, self-monitoring, reinforcement, and peer modelling, whereas SDT may facilitate long-term adherence by strengthening autonomy, competence, relatedness, and intrinsic motivation (Deci & Ryan, 2000; McAuley et al., 2007; Teixeira et al., 2022).

In clinical practice, healthcare professionals may apply SCT-based strategies such as SMART goal setting, self-monitoring, graded activity progression, and positive feedback to enhance confidence and encourage physical activity participation. Combining these approaches with motivational interviewing may further support autonomy and intrinsic motivation, particularly among older adults experiencing fear of falling, fatigue, or low confidence (Larsen et al., 2021).

At the community level, programmes such as peer-led exercise groups, walking clubs, and community-based activities may promote self-efficacy through observational learning and reinforcement while fostering relatedness and competence through social participation. Providing opportunities for older adults to select preferred activities and participation settings may further enhance autonomy and support sustained engagement (Ng et al., 2012; Cotter et al., 2024).

At the programme and policy level, interventions should adopt a phased and theory-informed approach that combines behavioural activation with motivational maintenance. In collectivist settings such as Malaysia, culturally adapted strategies involving family support, community engagement, accessible facilities, safe environments, and affordable group-based activities may help reduce participation barriers while strengthening both behavioural and motivational determinants of physical activity.

Bridging SCT and SDT in Practice

Motivational interviewing represents a useful bridging technique because it may support both self-efficacy and autonomy. It helps older adults explore ambivalence, identify personally meaningful reasons for being active, and set realistic activity goals. When combined with self-monitoring tools, feedback, and gradual progression, motivational interviewing may align behavioural activation with internal motivation, thereby supporting both physical activity initiation and maintenance (Larsen et al., 2021; Si et al., 2024). This integrated approach may be especially relevant for pre-frail older adults, who often require both structured support and motivational encouragement to sustain active ageing behaviours.

RECOMMENDATION FOR FUTURE RESEARCH

Future research should move beyond theoretical discussion and empirically evaluate integrated SCT–SDT approaches for promoting physical activity among pre-frail older adults. Intervention studies should clearly incorporate SCT-based strategies, such as goal setting, self-monitoring, feedback, and reinforcement, alongside SDT-based components including autonomy support, competence-building, relatedness, and motivational interviewing.

Longitudinal and intervention-based studies are needed to determine whether integrated SCT–SDT approaches can support both physical activity initiation and long-term adherence. Future research should also examine potential behavioural and psychological mediators, including self-efficacy, self-regulation, autonomy, competence, relatedness, motivation, psychological well-being, and quality of life, to better understand the mechanisms underlying behavioural change.

In addition, culturally contextualised research is needed in Malaysia and other Asian settings. Factors such as family involvement, collectivist values, environmental accessibility, and community support should be considered when designing and evaluating physical activity interventions (Hamid et al., 2018; Zainudin et al., 2020).

Finally, implementation studies should explore the feasibility, acceptability, sustainability, and real-world application of integrated SCT–SDT programmes within clinical and community settings. Such research may facilitate the translation of theoretical frameworks into effective strategies for promoting active ageing and preventing frailty progression among pre-frail older adults.

CONCLUSION

This narrative review highlights the value of integrating Social Cognitive Theory (SCT) and Self-Determination Theory (SDT) to promote physical activity among pre-frail older adults. SCT may support behavioural initiation through self-efficacy and self-regulation, whereas SDT may facilitate long-term adherence through autonomy, competence, relatedness, and autonomous motivation. The proposed SCT–SDT pathway provides a framework linking behavioural activation with motivational maintenance.

Theory-informed interventions should combine structured confidence-building strategies with autonomy-supportive and socially engaging activities. Future research should

evaluate integrated SCT–SDT interventions using longitudinal and intervention-based designs to determine their effectiveness in promoting sustained physical activity among pre-frail older adults.

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AUTHOR'S CONTRIBUTION

Mahirah Kamaron (MK) conceptualised and designed the study, conducted the literature search, synthesised data, and prepared the manuscript draft. Azliyana Azizan (AA) provided supervision, conceptual direction, and critical revisions to refine the analysis and presentation. Both authors reviewed, edited, and approved the final version of the manuscript.

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