

Resilience and Perceived Successful Ageing in Malaysia: The Mediating Role of Ageing Adaptation Among Middle-Aged Civil Servants in Malaysia

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Abstract

Malaysia's ageing population increases the need to understand how adults prepare for later life before entering old age. This study examined whether individual and environmental resilience were associated with perceived successful ageing among middle-aged Malaysian civil servants and whether ageing adaptation mediated these relationships. A cross-sectional survey was completed by 403 civil servants aged 41–59 years. Resilience, ageing adaptation and perceived successful ageing were measured using established instruments. Partial least squares structural equation modelling was used to evaluate the measurement and structural models, with 10,000 bootstrap resamples used to test direct and indirect effects. Individual resilience had a significant positive association with perceived successful ageing, whereas environmental resilience showed a more limited direct contribution. Ageing adaptation partially mediated the relationship between resilience and perceived successful ageing. Adaptation through Psychological Growth was the strongest ageing-adaptation pathway, followed by Adaptation to Physical Change, while Adaptation to Psychosocial Loss was not significant. The findings indicate that successful ageing preparation during middle age depends not only on personal resilience but also on the capacity to interpret age-related changes constructively and sustain psychological growth. Interventions and workplace policies should strengthen individual resilience, coping resources and positive adaptation to ageing among middle-aged employees. The findings support a developmental approach that begins successful-ageing preparation before later life.

Keywords: successful ageing, resilience, ageing adaptation, middle age, PLS-SEM

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Introduction

Malaysia is experiencing a significant demographic shift, marked by a swift increase in the proportion of older adults (Chung et al., 2020). Projections suggest that by 2030, individuals aged 60 and above will make up 15% of the population, officially designating Malaysia as an ageing nation. This transition is largely fuelled by rising life expectancy and declining fertility rates (Abdul Karim et al., 2023). However, national ageing interventions have primarily concentrated on older adults, often neglecting the significance of preparing individuals earlier in life for this change (Abdullah et al., 2024). In this context, the field of social gerontology has become progressively important, as it examines the social, cultural, and psychological aspects of ageing rather than focusing solely on biomedical needs. Social gerontology emphasises the role of lifelong social support, meaningful engagement, community inclusion, and resilience-building to promote healthy and successful ageing (Hamid et al., 2012). This broader perspective acknowledges that ageing is not an abrupt stage beginning at 60, but a continual process influenced by earlier life experiences, social environments, and adaptive capacities developed during midlife (Infurna, 2021). As Malaysia moves toward an ageing society, integrating social gerontological principles into policy, community planning, and public education becomes essential to foster a more proactive and holistic approach to ageing well.

Middle Age as a Critical Window for Ageing Preparation

Middle age (41–59 years) represents a significant life stage characterised by physiological changes, role transitions, occupational pressures, and changes in caregiving responsibilities that create substantial demands (Chaphalkar, 2024). These experiences shape individuals' perceptions of ageing and their ability to navigate its challenges. The psychological and emotional patterns established during this period can have a lasting effect on well-being in later life (Allemand et al., 2015).

Despite these realities, research and policy in Malaysia continue to address ageing primarily as an issue relevant only to senior citizens (Hamid et al., 2012). However, middle age is increasingly recognised in social gerontology as a critical transitional phase in the ageing process, one in which individuals begin to internalise and make sense of ageing, reassess life priorities, and develop coping strategies in response to evolving physical, social, and emotional circumstances. Rather than viewing ageing as a sudden shift that begins at 60, social gerontology highlights that ageing is a lifelong process shaped by earlier life experiences, social environments, and accumulated resilience over the years (Ford & Ford, 2018).

In this context, middle age serves as a preparatory stage that can either moderate or intensify challenges in later life. Building social connectedness, fostering adaptive coping skills, and strengthening personal and environmental resilience during this period can significantly contribute to positive ageing outcomes (Hertzog & Dixon, 2005). Therefore, incorporating social gerontological principles into interventions targeted at middle-aged adults, such as promoting work-life balance, community engagement, financial planning, and psychological well-being, can support a smoother transition into later life and encourage a more proactive, empowered approach to ageing in Malaysia.

Theoretical Framework

The Selective Optimisation with Compensation (SOC) model serves as the theoretical foundation for this study. SOC posits that individuals sustain their functioning throughout the lifespan by selecting meaningful goals, optimising their strategies to achieve these goals, and compensating for any declines. The concepts of resilience and adaptation in ageing embody these mechanisms, illustrating how individuals adjust to age-related changes.

Study Purpose

This research explores the interconnected dynamics of resilience, the process of ageing adaptation, and the perceptions of successful ageing among middle-aged civil servants residing in Putrajaya. The study is structured around three core objectives:

- **Evaluating the Predictive Role of Resilience:** This research objective seeks to explore the relationship between resilience, conceptualised as the capacity to recover from adversity while sustaining psychological well-being, and its impact on individuals' overall adaptation to the ageing process, as well as their perceptions of successful ageing. The investigation aims to elucidate how resilience contributes to the mechanisms of adaptation in the context of ageing, thereby influencing subjective evaluations of successful ageing during this life stage.
- **Examining the Mediating Influence of Ageing Adaptation:** This portion of the investigation explores the concept of ageing adaptation, which refers to an individual's ability to manage the physical, emotional, and social changes that accompany the ageing process. In particular, it analyses how this adaptation serves as a mediating variable in the relationship between resilience and the perception of successful ageing.
- **Identifying the Most Significant Impact on Successful Ageing:** This objective aims to identify the specific dimensions of resilience and ageing adaptation that exert the most significant influence on individuals' perceptions of successful ageing. By examining these domains, the research seeks to elucidate the characteristics that contribute to a favourable perception of ageing, thereby enhancing our understanding of the multidimensional nature of successful ageing.

This study aims to contribute to the existing literature by providing a comprehensive analysis of the relationships under investigation. The findings aim to yield valuable insights that can inform policy initiatives and practical interventions aimed at enhancing the quality of life for middle-aged civil servants as they confront the multifaceted challenges associated with aging.

Methods

Study Design and Participants

A cross-sectional quantitative research design was used. The sample comprised 403 civil servants aged 41–59 years who were employed in federal ministries in Putrajaya, Malaysia. A multistage procedure was applied: seven ministries were randomly selected at the first stage, after which civil servants meeting the age and employment criteria were identified from the available lists and invited to complete the online questionnaire. Participation was voluntary; therefore, random selection occurred at the ministry level, while individual recruitment was eligibility-based. Middle-aged civil servants were selected because they represent a working population balancing occupational, family and social responsibilities during a consequential stage of preparation for later life.

Instruments

Resilience

To assess resilience, this study reviewed several instruments that have been applied in ageing and resilience research. Previous attempts to measure resilience among older adults have often neglected environmental influences, focusing primarily on community-dwelling populations. Whitehall et al. (2021) addressed this limitation through the Making it CLEAR (MiC) Questionnaire, a multidimensional tool comprising 34 items measuring both Individual Determinants of Resilience (IDoR) and Environmental Determinants of Resilience (EDoR). While this instrument provided valuable insights, it was developed mainly for clinical settings involving older patients discharged from hospitals, thus limiting its generalisability to community or working populations. Thus, the study also incorporated Connor and Davidson's (2003) Resilience Scale (CD-RISC) to measure resilience. The CD-RISC is a brief, self-rated instrument with strong psychometric properties, designed to assess the capacity to cope with stress and recover from adversity. It conceptualises resilience as a dynamic construct shaped by both individual strengths and health status. However, literature suggests that both the CD-RISC and MiC scales focus predominantly on intrinsic factors and may not fully capture the extrinsic and existential aspects of resilience that are particularly salient for ageing populations. To address this, the conceptual foundation of the Resilience Scale for Older Adults (RSOA) developed by Li and Ow (2021) was also considered. The RSOA integrates five key dimensions, personal strength, family support, social support, meaning and purpose in life, and religious or spiritual beliefs, providing a holistic view of resilience that acknowledges both personal and contextual resources. This broader conceptualisation guided the interpretation of resilience in the present study, reflecting the psychosocial complexity of middle-aged individuals navigating occupational and life-stage demands.

The resilience scale used in this study was developed by integrating relevant items and conceptual dimensions from the CD-RISC, MiC, and RSOA instruments, and was subsequently reviewed and evaluated by a panel of subject-matter experts to ensure content validity, cultural relevance, and conceptual clarity before finalisation.

Ageing Adaptation

Ageing Adaptation was measured using the Attitudes to Ageing Questionnaire (AAQ), a self-report instrument assessing perceptions of and responses to the ageing process (Laidlaw et al., 2007; Pedroso de Lima et al., 2022). The original AAQ comprises three dimensions: Psychosocial Loss, Physical Change, and Psychological Growth. In the present study, these dimensions were operationalised as Adaptation to Psychosocial Loss (APL), Adaptation to Physical Change (APC), and Adaptation through Psychological Growth (APG), with eight items representing each dimension. APG is a study-specific operational label; Psychological Growth remains the original name of the AAQ dimension.

The *psychosocial loss* subscale assesses negative attitudes related to emotional and social decline, while the *physical change* subscale focuses on attitudes towards health, exercise, and bodily changes. The *psychological growth* subscale captures positive dimensions such as wisdom, self-reflection, and personal development. The AAQ not only contributes to understanding adaptability in later life but also provides insights into attitudes that may predict successful ageing outcomes.

To further strengthen the construct of adaptability, responses from selected items in the CD-RISC were also considered. According to Montross et al. (2006), positive adaptation can be operationally defined through endorsement of statements such as “*I am able to adapt to change*” and “*I try to bounce back after illness or hardship*.” Incorporating these items supports a multidimensional understanding of adaptability that links resilience and attitudinal flexibility in the ageing process.

Successful Ageing

The instrument used to measure perceived successful ageing (PSA) was adapted from Cheng et al. (2021), whose study explored public perceptions of ageing and identified the key dimensions of successful ageing among Malaysians. This instrument was chosen because of its conceptual alignment with the present study and the similarity of the targeted population, middle-aged adults in Malaysia. The original scale examines how individuals across different age groups perceive ageing, the qualities associated with ageing well, and the factors contributing to a fulfilling old age. Its focus on the Malaysian cultural and policy context ensures its relevance and applicability to this study’s objectives. Additionally, the Successful Ageing Scale (SAS) developed by Reker (2009) was incorporated to strengthen the multidimensionality of the measure. The SAS integrates core elements from four major models of successful ageing:

1. The psychological well-being model (Ryff, 1982),
2. The Selective Optimisation with Compensation (SOC) model (Baltes & Baltes, 1990),
3. The primary and secondary control model (Schulz & Heckhausen, 1996), and
4. The disease–cognitive functioning–engagement–engagement model (Rowe & Kahn, 1997).

By combining these theoretical perspectives, the SAS provides a comprehensive assessment of successful ageing across physical, psychological, and social domains. Together, the adapted instrument from (Cheng et al., 2021) and the SAS (Reker, 2009) ensured that all key elements of successful ageing were captured within the Malaysian context, offering a robust foundation for examining how resilience and ageing adaptation contribute to ageing well among middle-aged civil servants.

Data Analysis

Data Analysis Procedure

Data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM), which is well-suited for complex theoretical models, latent constructs with multiple dimensions, and studies emphasising prediction. PLS-SEM was selected due to its robustness in handling non-normal data and its capacity to model higher-order constructs, both of which were relevant in this study. The analysis was conducted using SmartPLS, following a systematic two-stage approach that encompassed the evaluation of the measurement model and the assessment of the structural model. In addition, mediation analysis and predictive assessment were undertaken to provide a comprehensive evaluation of the model’s explanatory and predictive capabilities.

Measurement Model Evaluation

The measurement model was assessed to establish the quality and validity of the latent constructs. For reflective indicators, indicator reliability was examined through outer loadings, and internal consistency reliability was evaluated using Composite Reliability (CR). Convergent validity was assessed through the Average Variance Extracted (AVE), ensuring that each construct captured sufficient variance from its indicators. Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT), confirming that each construct was conceptually and empirically distinct.

Given that the study included higher-order constructs (Resilience and Adaptation), the hierarchical component modelling (HCM) procedure was applied to verify the relationships between lower-order and higher-order components, ensuring conceptual clarity and measurement robustness.

Structural Model Assessment

Following the validation of the measurement model, the structural model was analysed to test the hypothesised relationships. Path coefficients were examined to determine the strength and significance of direct effects, using a bootstrapping procedure to generate standard errors and confidence intervals. Model explanatory power was assessed through the coefficient of determination (R^2) for each endogenous construct. Effect sizes (f^2) were calculated to evaluate the relative impact of predictor constructs, and collinearity diagnostics were performed to ensure the absence of multicollinearity among independent variables.

Mediation Analysis

To examine whether Adaptation functioned as a mediator between Resilience and Successful Ageing, indirect effects were analysed using bootstrapped confidence intervals. This procedure allowed for the evaluation of the magnitude and significance of mediation effects, identifying whether the mediation was partial or full, and clarifying the mechanism through which resilience-related factors influence ageing outcomes.

Predictive Relevance

Finally, the predictive performance of the model was assessed using PLS Predict, which compares model-generated prediction errors with those of a linear benchmark model. Q^2 predict values, along with Root Mean Squared Error (RMSE) and Mean Absolute Error (MAE) statistics, indicated that the model demonstrated strong predictive relevance, suggesting that the constructs meaningfully predict outcomes related to successful ageing.

Results

Direct Effects

The analysis revealed that individual resilience had a significant and positive influence on both ageing adaptation and perceived successful ageing. This indicates that individuals who possess greater psychological and personal coping resources are better able to adjust to age-related changes and subsequently report higher levels of well-being as they age. In contrast, environmental resilience, which reflects external support and community resources, showed

minimal and statistically weak effects on both adaptation and successful ageing. This suggests that, within this population, internal coping strengths play a more substantial role than external contextual factors in shaping ageing trajectories.

Mediation Effects

Further analysis demonstrated that ageing adaptation serves as a significant mediating mechanism in the relationship between individual resilience and successful ageing. Among the three dimensions of adaptation, psychological growth emerged as the most influential mediating pathway, indicating that the ability to find meaning, develop maturity, and reframe ageing positively is particularly critical in facilitating successful ageing outcomes. This underscores the importance of internal psychological development during midlife in shaping how individuals transition into later stages of life.

Overall, these findings highlight that building personal resilience and fostering psychological growth during middle age are key leverage points for promoting successful ageing. Interventions aimed at strengthening adaptability, developing reflective coping strategies, and enhancing positive interpretations of ageing may therefore be more impactful than strategies focused solely on modifying external environments.

Discussion

The main highlight of the findings in this study is the critical role of psychological resources cultivated during middle age in shaping successful ageing. The results show that individual resilience, reflecting personal coping strengths and self-regulatory abilities, significantly influences both ageing adaptation and perceived successful ageing. In contrast, environmental resilience exhibited minimal impact, indicating that internal psychological capabilities may be more decisive than external support structures during this life stage.

Substantially, ageing adaptation emerged as a key mediating mechanism, particularly the dimension of psychological growth, which reflects one's capacity to interpret ageing as a meaningful and developmental process. In order to be well-equipped and to be able to transition well and smoothly into older adulthood, individuals should be able to reframe ageing successfully by deriving their purpose and adjusting their expectations accordingly. This underscores that successful ageing is not merely an outcome observed in old age, but rather the culmination of psychological patterns, coping resources, and belief systems formed earlier in life.

These insights align with perspectives in social gerontology, which emphasise ageing as a continuous and socially embedded process rather than a discrete event that begins at age 60. Middle age, therefore, serves as a critical transition period in which individuals begin to renegotiate identity, manage increasing social roles, and confront early markers of physical and psychosocial change. Strengthening resilience and fostering positive interpretations of ageing during midlife may buffer age-related stressors and enhance well-being in older adulthood.

Overall, the findings suggest that interventions aiming to promote successful ageing should go beyond healthcare and social support targeting older adults. Instead, greater emphasis is needed on midlife psychological development, including resilience-building, cognitive reframing, emotional regulation, and meaning-making. Such approaches align with global social

gerontological efforts to shift ageing policy “upstream,” promoting proactive and lifelong approaches to ageing well.

Policy Implications

The findings suggest the need for a strategic shift in healthy ageing initiatives. First, national healthy ageing policies should prioritise early-life and midlife preparation, rather than focusing interventions solely on older adults. Second, workplace wellness programs should incorporate resilience-building and adaptation training, recognising the workplace as a critical environment where middle-aged individuals experience significant stress and identity transition. Finally, public discourses on ageing should be reframed to emphasise development, meaning, and psychological growth, in order to counter decline-oriented narratives and encourage a more empowered and proactive approach to ageing across the life course.

Conclusion

This study underscores middle age as a pivotal developmental stage that shapes trajectories of ageing long before individuals enter later life. The findings demonstrate that individual resilience serves as a central psychological resource during this period, exerting significant direct effects on both ageing adaptation and perceived successful ageing. Moreover, the results establish ageing adaptation, particularly the capacity for psychological growth, as the key mediating mechanism through which resilience translates into positive ageing outcomes. This indicates that successful ageing is not simply a function of physical health or external support systems but is substantially influenced by the internal interpretive and coping processes cultivated during midlife.

Comparatively, while studies in Western contexts tend to highlight the importance of both personal agency and institutional supports, and research from East Asian and collectivist regions often emphasises family and community embeddedness, the present findings reveal a distinct pattern within the Malaysian middle-aged population. Here, internal psychological capabilities outweigh the influence of environmental resilience, suggesting that middle-aged Malaysians may rely more heavily on personal coping strategies than on external structural supports when negotiating ageing-related challenges. This nuance contributes important regional insight to the broader field of social gerontology, demonstrating that the determinants of successful ageing cannot be assumed to be culturally uniform.

Conceptually, the study advances the understanding that ageing is a lifelong process, aligning with contemporary gerontological perspectives that highlight the continuity between midlife experiences and later-life outcomes. Methodologically, the integration of higher-order construct modelling and predictive assessments strengthens the robustness of the findings and positions this work as a meaningful contribution to ageing research in developing contexts.

Collectively, the results call for a strategic reframing of ageing policy and practice in Malaysia. Efforts to promote successful ageing should not be confined to elderly care, but instead should prioritise midlife interventions that cultivate resilience, foster adaptive meaning-making, and encourage positive reappraisal of ageing. By investing in the psychological development of individuals during their forties and fifties, Malaysia stands to enhance later-life well-being and reduce long-term social and health burdens as the nation advances toward an ageing demographic profile.

In sum, this study illustrates that the foundations of successful ageing are laid in middle age, through the internal psychological strengths and adaptive capacities individuals build over time. Recognising and supporting this developmental process is essential for ensuring both personal well-being and societal preparedness in the context of global population ageing.

Novelty Statement

This study offers a distinct and meaningful contribution to the ageing literature by positioning middle age, not old age, as the critical developmental point at which the foundations of successful ageing are shaped. Specifically, it is one of the first empirical studies in Malaysia, and among the earliest in the Southeast Asian region, to demonstrate that psychological growth acts as the central adaptive mechanism through which individual resilience translates into successful ageing outcomes. By empirically validating this pathway, the study extends the Selection–Optimisation–Compensation (SOC) framework into a new cultural and policy context, showing that adaptive reappraisal and meaning-making during midlife are not merely desirable traits but core psychological processes that determine later-life well-being.

Moreover, the higher-order PLS-SEM model approach employed in this study allows resilience and adaptation to be examined as multidimensional constructs, offering a granularity rarely captured in regional ageing research. This methodological sophistication, combined with culturally grounded insights, establishes the study's novelty: it redefines successful ageing as a lifespan developmental process shaped early, and provides empirical evidence to support a strategic shift in ageing policy toward midlife psychological strengthening.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this manuscript, the authors used OpenAI's ChatGPT to assist with language editing, proofreading, formatting and consistency checking. The authors reviewed and revised all AI-assisted output and take full responsibility for the content of the manuscript.

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