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The Midlife Dementia Risk-Management Paradox: Developing the Concept of Preventive Capacity for Dementia Prevention

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Abstract

Dementia prevention has increasingly moved beyond the identification of individual risk factors towards multidomain and life-course approaches, consistent with evidence that risk accumulates and interacts across the lifespan [1,2]. Midlife is an important period because several modifiable exposures during this stage are associated with later dementia, while adults may simultaneously face substantial occupational, family, financial and social demands [3,4]. Yet identifying potentially modifiable risks does not by itself resolve the practical problem of managing prevention. Individuals may need to interpret multiple recommendations, determine their relative importance, reconcile them with competing demands, translate intentions into action and sustain behaviours as circumstances change. This conceptual paper develops the Midlife Dementia Risk-Management Paradox and proposes Midlife Preventive Capacity (MPC) as a prevention-specific extension of workload-capacity thinking. The paradox describes a tension in which expanding knowledge of modifiable dementia risk creates additional opportunities for prevention while potentially increasing the number and complexity of decisions that individuals must coordinate. It is expressed through four interacting processes: risk proliferation, risk convergence, risk competition and risk prioritisation. MPC is defined as the dynamic capacity, supported by relevant relational and structural resources, to recognise, integrate, prioritise, implement, adapt and sustain responses to multiple potentially modifiable dementia-associated risks within the circumstances of midlife. The construct is explicitly distinguished from health literacy, self-efficacy and COM-B, and from the established concept of prevention burden. Prevention burden concerns the workload and demands generated by preventive activity; MPC concerns the capacity to manage that workload as a coordinated portfolio of preventive action. Drawing on the Cumulative Complexity Model and minimally disruptive medicine, the paper extends workload-capacity reasoning from diagnosed chronic illness to pre-diagnosis dementia-risk management. The framework generates empirically testable propositions concerning prevention complexity, prioritisation, contextual constraint, support and sustainability. MPC is presented as a provisional construct requiring empirical validation, not as an established determinant of dementia outcomes.

Keywords: Dementia Prevention, Midlife, Dementia Risk, Risk Management, Preventive Capacity; Prevention Burden, Treatment Burden, Cumulative Complexity Model, Risk Prioritisation, Multidomain Prevention, Health Behaviour, Life-Course Prevention

1. Introduction

Dementia prevention has become an increasingly important component of contemporary public health. Evidence indicates that dementia is influenced by multiple potentially modifiable factors across the life course, including vascular, metabolic, behavioural, psychological and social exposures [5]. Early modelling suggested that reducing a limited number of modifiable risk factors could have meaningful population-level effects on dementia prevalence,

and subsequent guidance has increasingly promoted action across multiple domains [6,7]. This has transformed dementia prevention from a predominantly late-life clinical concern into a life-course public-health agenda.

This shift is consistent with life-course epidemiological models in which exposures accumulate, interact and acquire different significance according to their timing within the lifespan [8]. The

implication is important: dementia prevention is no longer simply a question of identifying isolated risk factors but increasingly involves managing a portfolio of potentially modifiable exposures and behaviours.

Midlife occupies an important position within this prevention landscape. A systematic review and meta-analysis of 34 prospective cohort studies found associations between several midlife modifiable factors and subsequent dementia, including obesity, diabetes, current smoking, hypercholesterolaemia and hypertension. Contemporary prevention recommendations likewise emphasise multiple risk domains and life stages. Yet an important conceptual problem remains: the identification of dementia risk factors is not equivalent to the successful management of dementia risk.

Knowing that physical activity, smoking, hypertension, diabetes, obesity, cholesterol, depression, social engagement or other factors may be relevant does not by itself determine how an

individual should respond when several considerations coexist. Epidemiological evidence does not tell an individual which action should come first, how effort should be distributed across behaviours, how competing demands should be reconciled, or how preventive behaviour should be sustained when circumstances change. Midlife is especially relevant because employment, family responsibilities, financial circumstances, established routines and access to resources can influence the uptake and maintenance of healthy behaviours.

2. From Risk Factors to Risk Management

Consequently, contemporary dementia prevention presents a conceptual tension: the evidence base is becoming more comprehensive at the same time as the practical work required to act on that evidence may become more complex. This paper does not argue that expanding prevention knowledge is undesirable. Rather, it asks whether prevention science has sufficiently theorised the capacity required to translate multiple recommendations into feasible, coordinated and sustainable action.

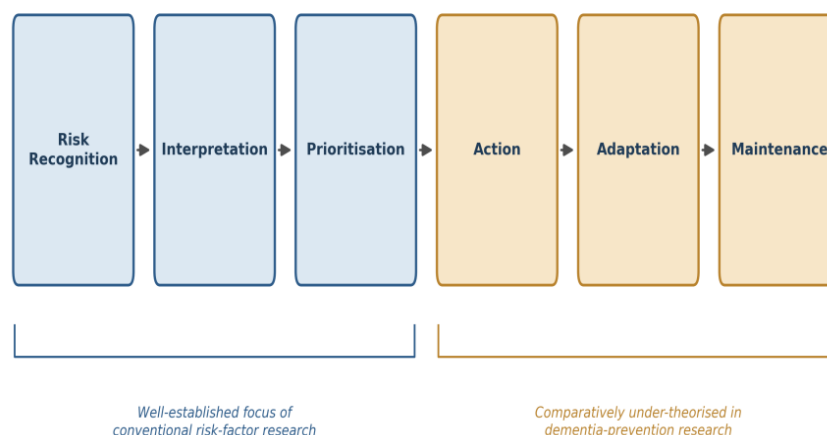


Figure 1: The Prevention Pathway: From Risk Recognition to Sustained Behaviour

Note: Original conceptual diagram proposed in this paper, adapted from the practical sequence described in Section 2. The six-stage pathway is illustrative rather than strictly linear in practice, as later stages may loop back to earlier ones as circumstances change.

Much dementia-prevention research has appropriately concentrated on identifying risk factors and determining whether modifying those factors may reduce subsequent dementia risk. That work establishes the potential contents of prevention, but it does not exhaust the prevention problem. A complementary conceptual sequence is recognition, interpretation, integration, prioritisation, implementation, adaptation and maintenance. The later stages concern the management of prevention itself and provide the point of departure for the present model.

Figure 1 presents prevention as a practical pathway rather than a strictly linear behavioural sequence. The purpose is not to imply that recognition necessarily precedes every other process or that all individuals move through identical stages. Instead, the pathway makes visible a set of tasks that may be required when multiple

prevention opportunities coexist and must be managed over time.

Multidomain intervention research illustrates the issue. In the FINGER trial, participants received a combination of dietary counselling, exercise, cognitive training and vascular-risk monitoring, with the intervention associated with beneficial effects on cognitive outcomes compared with control [9]. The subsequent Multidomain Alzheimer Preventive Trial (MAPT) tested a comparable multidomain intervention, with or without omega-3 supplementation, and found no significant overall effect on cognitive decline across the full trial population, although benefit was observed in pre-specified higher-risk subgroups [10]. Together, these trials demonstrate that dementia prevention need not be conceptualised as addressing one risk factor at a time, but multidomain intervention of this kind also creates multiple

simultaneous behavioural demands.

Coley examining adherence in the FINGER and MAPT trials, found that adherence varied between intervention components and decreased as intervention complexity and intensity increased, highlighting an important issue for prevention science: the number of recommended actions may itself become relevant to whether those actions can be maintained [11]. The implication is not that multidomain prevention is inappropriate, but rather that the field requires a stronger conceptual understanding of prevention manageability.

3. The Midlife Dementia Risk-Management Paradox

The Midlife Dementia Risk-Management Paradox is defined as follows: as knowledge of potentially modifiable dementia risks expands, opportunities for prevention increase, but so too may the number, interdependence and competing demands of the preventive decisions that individuals must manage. The paradox is therefore not a claim that more knowledge necessarily harms prevention. It identifies a potential tension between the expansion of prevention opportunity and the finite capacity of individuals, families, communities and systems to translate those opportunities into sustained action.

As knowledge of potentially modifiable dementia risks expands, opportunities for prevention increase, but so too may the number, complexity and competing demands of the preventive decisions that individuals must manage.

The paradox comprises four components, described in turn below.

3.1. Risk Proliferation

Risk proliferation refers to the expansion of the number of potentially modifiable targets identified by the evidence base. This expansion represents scientific progress. However, from the perspective of implementation, each additional target may introduce another decision, behaviour, monitoring task or healthcare interaction. The conceptual issue is therefore not the number of risk factors in the population, but the number and complexity of prevention tasks that may be generated for a particular person.

3.2. Risk Convergence

Risk convergence refers to the coexistence of multiple relevant prevention considerations within the same person. Midlife hypertension, diabetes, obesity, smoking and hypercholesterolaemia, for example, may occur together rather than as isolated problems. The individual therefore faces a portfolio of prevention considerations, potentially involving interacting behaviours, clinical management and social circumstances.

3.3. Risk Competition

Risk competition refers to competition among prevention activities for finite resources. Time, money, attention, motivation, physical capacity, access to services and social support are not unlimited. Evidence on midlife health behaviour indicates that employment, family responsibilities, financial circumstances, established

behaviours, access and environmental conditions can influence whether healthy behaviours are adopted and maintained.

3.4. Risk Prioritisation

Risk prioritisation follows from convergence and competition. When several prevention opportunities coexist but available resources are finite, decisions about sequencing and emphasis become unavoidable. Which action should occur first? Which actions can reasonably be combined? Which can be deferred? Which require professional, family or community support? These are management questions rather than risk-factor questions, and they provide a central conceptual entry point for MPC.

Which prevention action should happen first, which can happen simultaneously, which should be deferred, and which may require support from another person or service?

This question is rarely represented explicitly in conventional dementia-risk models, and that omission provides the conceptual entry point for the present paper.

4. The Prevention Problem is Not Simply Knowledge

Health education can imply a progression from knowledge to action, yet the relationship between health information and behaviour is more conditional. Health literacy is an important foundation: Sørensen conceptualised health literacy as involving competencies in accessing, understanding, appraising and applying health information in healthcare, disease prevention and health promotion [12]. These competencies are relevant to dementia prevention. However, the ability to understand information does not necessarily determine how multiple recommendations are organised, prioritised, implemented or sustained in everyday life.

The distinction should not be overstated. Health literacy may contribute to MPC, and the two constructs may be correlated. The claim is instead that they operate at different conceptual levels. Health literacy concerns the capabilities involved in engaging with health information; MPC concerns the management of multiple prevention demands after information has been recognised as relevant. Establishing whether the constructs are empirically separable is therefore a central research task rather than an assumption of the present paper.

5. Introducing Midlife Preventive Capacity

5.1. Definition

Building on this distinction, Midlife Preventive Capacity (MPC) is proposed as:

The dynamic capacity of an individual, together with relevant relational and structural resources, to recognise, integrate, prioritise, implement, adapt and sustain responses to multiple potentially modifiable dementia-associated risks within the circumstances of midlife.

MPC is proposed as a higher-order, context-dependent construct concerned with managing prevention as a coordinated portfolio rather than performing a single preventive behaviour. It is not

synonymous with knowledge, motivation, health literacy or self-efficacy. Nor is it intended to replace the established concept of prevention burden. Rather, prevention burden and MPC are conceptual complements: prevention burden concerns the demands generated by prevention, whereas MPC concerns the capacity available to manage those demands.

6. The Six Dimensions of Midlife Preventive Capacity

MPC comprises six interconnected dimensions, described below.

6.1. Recognition

Recognition refers to identifying which prevention opportunities are relevant to the person, including noticing that a behaviour, clinical risk or exposure may warrant attention. Recognition includes more than factual knowledge because it involves judging relevance within an individual context.

6.2. Integration

Integration is the ability to situate multiple prevention considerations within a coherent personal health picture rather than treating each recommendation as an unrelated instruction. It concerns coordination across behaviours, clinical care, routines and social circumstances.

6.3. Prioritisation

Prioritisation concerns deciding which of several competing prevention opportunities should receive immediate attention, additional resources or professional support. Prioritisation is central to MPC because comprehensive recommendations cannot always be implemented simultaneously.

6.4. Implementation

Implementation is the translation of a selected prevention priority into actual behaviour or action. It is the point at which intention meets the practical circumstances, resources and constraints of everyday life.

6.5. Adaptation

Adaptation is the ongoing revision of prevention strategies as circumstances change. A routine that is workable at one point may become impractical when employment, caregiving responsibilities, finances, health status or other conditions change.

6.6. Sustainability

Sustainability concerns maintaining prevention activities over time. It distinguishes short-lived implementation from patterns of action that can endure across changing circumstances and therefore aligns MPC with the long-time horizon of dementia prevention.

7. The Midlife Preventive Capacity Model

Figure 2 presents the conceptual architecture proposed in this paper. Expanding dementia-prevention evidence may generate risk proliferation and risk convergence; these can increase risk competition and the need for risk prioritisation. The resulting prevention workload is proposed to interact with MPC, which comprises six interconnected dimensions and is expected to support feasible, adaptive and sustainable prevention. The model is deliberately non-causal at this stage: the arrows represent hypothesised relationships requiring empirical examination.

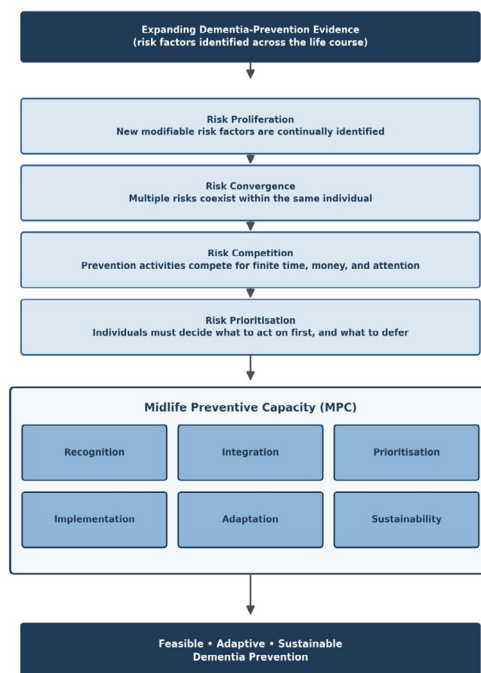


Figure 2: Conceptual Architecture of the Midlife Preventive Capacity (MPC) Model

Note: Original conceptual model proposed in this paper. It depicts a theoretical architecture rather than an empirically established causal pathway.

8. Preventive Capacity is not the Same as Self-Efficacy

Self-efficacy is relevant to health behaviour. Bandura conceptualised self-efficacy as beliefs concerning one's capability to organise and execute actions required to manage prospective situations [13]. MPC includes perceived capability but addresses a broader coordination problem. A person may believe they can exercise, change their diet or attend appointments and still struggle to determine how these activities should be organised alongside other prevention requirements. MPC therefore incorporates portfolio-level recognition, integration, prioritisation, adaptation and sustainability. Whether these features provide discriminant validity beyond self-efficacy remains an empirical question.

8.1. Preventive Capacity and the COM-B Model

The COM-B model provides a related but complementary perspective. COM-B conceptualises behaviour as a function of Capability, Opportunity and Motivation [14]. MPC is compatible with this model but addresses a different unit of analysis: the coordinated management of several simultaneously relevant prevention activities over time. A person may have sufficient capability, opportunity and motivation for individual behaviours yet experience difficulty managing them as a portfolio. MPC should therefore be treated as a proposed higher-order construct that may interact with, rather than supersede, established behaviour-change models.

This distinction also prevents MPC from becoming an overly broad synonym for 'capability'. The proposed construct is specifically anchored to the management of multiple dementia-prevention demands in midlife. Its empirical value will depend on demonstrating that this portfolio-management function explains variance not already captured by COM-B components or related constructs.

9. Preventive Capacity is not the Same as Health Literacy

Health literacy concerns the ability to access, understand, appraise and apply health information. MPC may depend partly on these capabilities, but extends the conceptual focus to what happens when several prevention opportunities must be coordinated in context. A person can have high health literacy while experiencing limited capacity to act because of competing work demands, caring responsibilities, financial constraints, limited access to services, lack of social support, competing health priorities or excessive intervention complexity.

- The distinction is therefore one of function rather than hierarchy: health literacy supports engagement with information, whereas MPC concerns the coordination and sustainability of preventive action under real-world constraints. The relationship between the constructs should be tested rather than assumed. In particular, future studies should establish whether MPC predicts prevention behaviour after accounting for health literacy.
- caring responsibilities;
- financial constraints;
- limited access to services;
- lack of social support;
- competing health priorities; or
- excessive intervention complexity.

This distinction is consistent with evidence that midlife health behaviour is influenced by contextual barriers and facilitators, and it follows that knowledge may be necessary for prevention, but knowledge alone does not constitute the capacity to manage prevention. Table 1 summarises how MPC relates to, and differs from, these established constructs.

Construct	Core Focus	Key Limitation Addressed by MPC
Health literacy (Sørensen et al., 2012)	Accessing, understanding, appraising and applying health information	Does not by itself specify how multiple prevention demands are prioritised, coordinated, adapted or sustained.
Self-efficacy (Bandura, 1977)	Perceived capability to organise and execute a course of action	Does not specify portfolio-level prioritisation and reconciliation among multiple prevention demands.
COM-B / Behaviour Change Wheel (Michie et al., 2011)	Capability, opportunity and motivation relevant to behaviour	Primarily explains conditions for behaviour; MPC addresses coordination of multiple prevention activities over time.
Cumulative Complexity Model / Minimally Disruptive Medicine (Shippee et al., 2012; Leppin et al., 2015)	Relationship between workload and capacity in chronic illness	Developed primarily around treatment/self-management of diagnosed illness; MPC adapts the logic to pre-diagnosis dementia-risk management.
Prevention burden (O'Donnell et al., 2020)	Workload and demands generated when people are asked to address multiple risk factors within their circumstances	Describes the demand placed on people; MPC is proposed as the complementary capacity construct concerned with managing that demand as a coordinated prevention portfolio.
Midlife Preventive Capacity (proposed)	Dynamic capacity to recognise, integrate, prioritise, implement, adapt and sustain multiple prevention activities within everyday midlife circumstances	Proposed as a dementia-prevention-specific capacity construct requiring empirical validation and discriminant testing.

Table 1: Midlife Preventive Capacity Compared with Related Constructs

10. Prevention Burden

Prevention burden is an important adjacent concept and should be treated as part of the theoretical foundation rather than as a construct originating in this paper. O'Donnell argued that public-health messages and interventions aimed at reducing noncommunicable-disease risk can impose a workload on people, particularly when multiple risk factors and contextual constraints coexist [15]. Their prevention-burden perspective explicitly links the demands of prevention to the capacity available to respond. This literature therefore provides an important precedent for the central problem identified here.

The present paper makes a narrower and different proposal. It asks whether a prevention-specific capacity construct can be articulated for midlife dementia-risk management and decomposed into dimensions that are directly relevant to the management of a portfolio of dementia-prevention activities. Prevention burden describes the work imposed by prevention; MPC describes the capacity to manage that work. The two concepts are therefore expected to be related, potentially reciprocally, but they are not interchangeable.

This distinction also changes the interpretation of the paradox. The concern is not simply that prevention recommendations are burdensome. Rather, increasing numbers of recommendations may create a mismatch between prevention demands and the capacity available to recognise, integrate, prioritise, implement, adapt and sustain them. The conceptual model therefore treats prevention burden as an important source of demand and MPC as the proposed capacity-side construct.

Prevention burden should not be interpreted as an argument against comprehensive prevention. Rather, it introduces a design question: how much prevention can reasonably be asked of a person at one time? This question may be particularly important when interventions move from research environments into everyday life.

10.1. Relationship to Treatment Burden and the Cumulative Complexity Model

The workload-capacity logic underlying MPC draws directly

on established work in chronic-disease self-management. The Cumulative Complexity Model conceptualises patient complexity through the relationship between workload and capacity, while minimally disruptive medicine argues that care should be designed around the realities of patients' lives [16-19]. Prevention burden provides an important bridge from this treatment-focused literature into prevention, because it explicitly recognises that public-health activity can itself impose work on people.

The proposed contribution is therefore an extension and specification rather than an invention of workload-capacity theory. Midlife dementia prevention differs from conventional treatment contexts because the person is typically asymptomatic, the outcome is probabilistic and distant, and recommendations may originate from population-level guidance rather than an individualised treatment plan. MPC adapts the capacity side of the workload-capacity logic to this setting and specifies six dimensions that can be examined empirically. This distinction should be tested rather than assumed: future research must determine whether MPC adds explanatory value beyond prevention burden, health literacy, self-efficacy and existing measures of patient capacity.

11. The Capacity–Complexity Relationship

The proposed model suggests that prevention complexity and preventive capacity interact to shape the feasibility of sustained prevention. Coley found that adherence varied across components of multidomain dementia-prevention interventions and was lower where intervention complexity and intensity were greater. This supports investigation of a capacity-complexity relationship, but it does not establish MPC as the moderator. Figure 3 is therefore a testable conceptual proposition rather than an established causal model.

The relationship can be framed as a mismatch hypothesis: as prevention demands increase, the likelihood of successful implementation may depend increasingly on the resources and capacities available to the individual. This hypothesis is consistent with the broader treatment-burden literature, but requires dementia-prevention-specific empirical testing.

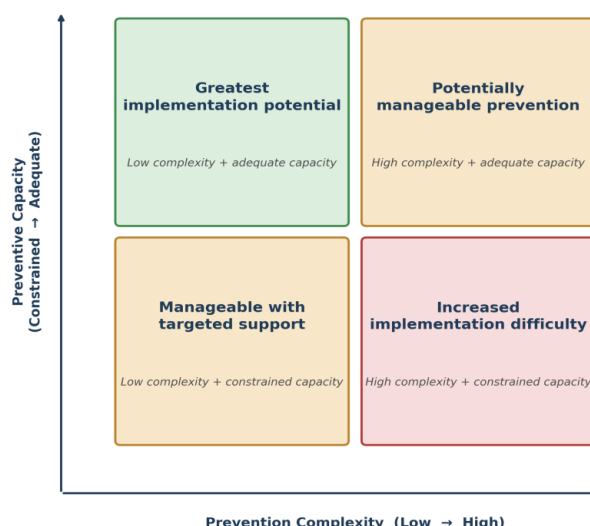


Figure 3: The Capacity-Complexity Interaction

Taken together, the preceding sections suggest a Sustainability Principle: a prevention strategy that is theoretically comprehensive but practically unsustainable may have less real-world preventive value than a strategically prioritised strategy that can be maintained. This is a hypothesis about implementation, not a claim that fewer prevention activities are inherently preferable.

The principle follows from the long-time horizon of dementia prevention. Benefits of risk reduction may be delayed for years or decades, whereas the time, financial, cognitive and organisational costs of behaviour change are experienced in the present. A prevention strategy therefore needs not only evidence of potential benefit but also a credible account of how the required activities can be incorporated into everyday life over time.

Taken together, the preceding sections point to a broader Sustainability Principle:

A prevention strategy that is theoretically comprehensive but practically unsustainable may have less real-world preventive value than a strategically prioritised strategy that can be maintained.

This does not mean that less prevention is necessarily better; rather, it distinguishes theoretical prevention potential from practical prevention sustainability. This distinction is particularly important because dementia prevention operates over long time horizons, whereas many health behaviours fluctuate according to changing life circumstances.

12. Why Midlife Is the Critical Context

Midlife provides an important context in which to investigate MPC for three related reasons. First, several modifiable risk factors during midlife are associated with later dementia. Second, midlife commonly involves employment, family responsibilities, financial demands and established social routines that can influence health behaviour. Third, contemporary dementia prevention increasingly

involves multiple risk domains rather than isolated targets. The convergence of epidemiological opportunity, behavioural demand and contextual constraint makes midlife a theoretically informative setting for studying prevention management.

13. Implications for Dementia-Prevention Research

The MPC model suggests that future dementia-prevention studies should investigate not only whether an intervention works, but also the work required to use it. Relevant questions include:

- i. How many actions does the intervention require?
- ii. How complex are those actions?
- iii. How do participants prioritise them?
- iv. Which actions are abandoned first?
- v. What contextual barriers interfere with implementation?
- vi. How does preventive behaviour change when circumstances change?
- vii. Which forms of support increase preventive capacity?
- viii. Does preventive capacity predict adherence or behavioural maintenance?

These questions shift evaluation from intervention efficacy alone towards implementation capability and sustainability.

14. Implications for Public Health

The model also challenges an exclusively individualised interpretation of prevention. Failure to implement every recommended behaviour should not automatically be attributed to inadequate motivation or knowledge. Prevention burden and MPC direct attention to the interaction between recommendations and the circumstances in which people are expected to act. This is consistent with evidence that time, finances, access, social support and environmental conditions influence healthy behaviour during midlife.

- Accordingly, improving preventive capacity may require changes to the design and delivery of prevention rather than

education alone. Potential approaches include simplifying recommendations; helping people prioritise rather than presenting all recommendations as equally urgent; reducing access barriers; integrating prevention into existing healthcare; supporting behaviour through social networks; reducing financial barriers; designing interventions around realistic routines; and enabling adaptation when circumstances change. These are conceptual implications and should not be interpreted as established intervention effects.

- prioritising rather than presenting all recommendations equally;
- reducing access barriers;
- integrating prevention into existing healthcare;
- supporting behaviour through social networks;
- reducing financial barriers;
- designing interventions around realistic routines; and
- enabling adaptation when circumstances change.

These are theoretical implications, not established intervention effects.

15. Implications for Digital Prevention

Digital dementia prevention is not the central object of this paper, and that distinction is deliberate. Nevertheless, the MPC framework suggests that digital prevention resources could move beyond information delivery towards supporting recognition, prioritisation, planning, implementation, monitoring, adaptation and maintenance. The value of such approaches should be evaluated in terms of whether they reduce prevention complexity, strengthen capacity or improve sustainable behaviour rather than simply increasing information exposure.

16. Theoretical Propositions

The model generates eight propositions, summarised in Table 2. P1, P3 and P6 are grounded in patterns already visible in the literature, while P2, P4, P5, P7 and P8 are conceptual extensions proposed for empirical testing. The distinction is important because the paper does not present the new propositions as established findings.

Prop.	Statement	Grounding
P1	Expansion of recognised dementia-prevention targets may increase the number and variety of prevention decisions individuals must manage.	Deckers et al. (2015); Livingston et al. (2024)
P2*	When multiple prevention opportunities coexist, the management of prevention requires prioritisation and sequencing.	Conceptual extension
P3	Time, financial resources, access, social circumstances and competing responsibilities may constrain preventive behaviour during midlife.	Kelly et al. (2016)
P4*	MPC should be empirically distinguishable from health literacy because it concerns portfolio-level prioritisation, implementation, adaptation and sustainability in addition to information-related capabilities.	Sørensen et al. (2012); conceptual extension
P5*	MPC is context-dependent and may vary with relational and structural resources rather than functioning solely as an individual attribute.	O'Donnell et al. (2020); conceptual extension
P6	Greater prevention complexity may create greater adherence challenges, particularly where prevention demands exceed available capacity.	Coley et al. (2019); Shippee et al. (2012)
P7*	Prioritised and sequenced prevention may be more sustainable than undifferentiated implementation of multiple recommendations.	Conceptual extension
P8*	Relational and structural support may strengthen the capacity to implement and sustain preventive behaviours.	O'Donnell et al. (2020); Kelly et al. (2016); conceptual extension
* Denotes a new theoretical proposition of this paper, rather than a restatement of an established empirical finding.		

Table 2: Theoretical Propositions Generated by the MPC Model

Read together, the propositions distinguish three levels of the framework. First, the prevention evidence can expand the number and variety of decisions people face. Second, the resulting workload may interact with individual, relational and structural capacity. Third, the way prevention is prioritised and sustained may influence implementation. The propositions are deliberately provisional and are intended to guide empirical work rather than close the debate.

Read together, these eight propositions divide roughly into two groups. The first (P1, P3 and P6) restate patterns that are already

visible in the existing literature once viewed through this lens; the second (P2, P4, P5, P7 and P8) go further, extending that logic into claims about prioritisation, context-dependence and support that have not, to our knowledge, been tested directly. It is this second group that would most benefit from early empirical attention, since they carry the most theoretical weight while currently resting on the least direct evidence.

This framework lays a foundation for future empirical validation of MPC's dimensions. These include: recognition, integration, prioritisation, implementation, adaptation, and sustainability,

and their roles in supporting sustained preventive behaviours. Developing reliable measures of these dimensions and examining how they influence adherence and health outcomes across diverse populations could inform targeted interventions. Such research would help bridge the gap between epidemiological evidence on risk factors and real-world behavioural implementation, guiding the design of feasible, equitable, and sustainable dementia prevention strategies. Operationalising MPC in future studies can ultimately support the development of policies that strengthen individuals' capacity to manage complex, multidomain prevention efforts over time.

17. Implications for Future Research and Policy

Building on the theoretical propositions outlined above, the following section discusses the broader implications for future research and policy development.

This conceptual framework offers a foundation for future empirical studies aimed at validating and operationalising Midlife Preventive Capacity (MPC). By developing reliable measures of MPC's dimensions: recognition, integration, prioritisation, implementation, adaptation, and sustainability, researchers can test the hypothesized relationships between capacity, prevention complexity, and adherence. Such studies will advance understanding of how capacity influences long-term behavioural maintenance and health outcomes, informing the design of more feasible, equitable, and sustainable prevention interventions. Moreover, policymakers and healthcare providers can leverage this model to redesign prevention strategies that acknowledge and strengthen individuals' capacity to manage multiple health behaviours, thereby improving intervention adherence and health equity across diverse populations. Ultimately, the framework aims to bridge the gap between epidemiological evidence and behavioural implementation, guiding more effective and sustainable dementia prevention efforts at both individual and population levels.

18. Conceptual Methodology

This is a conceptual theory-development paper rather than a systematic review or empirical study. The literature was selected purposively to connect five domains that are usually discussed separately: dementia-risk-factor and life-course research; multidomain dementia-prevention trials; intervention adherence and implementation; health-literacy, self-efficacy and behaviour-change theory; and workload-capacity approaches to chronic-disease self-management. The synthesis was used to identify a conceptual problem and develop a provisional construct rather than to estimate effect sizes.

ix. The workload-capacity tradition provides the principal theoretical parent. The Cumulative Complexity Model and minimally disruptive medicine conceptualise the relationship between the work people are asked to undertake and the capacity available to undertake it. Prevention-burden scholarship extends this logic to public-health risk reduction, explicitly recognising the demands placed on people by multiple prevention targets and the importance of contextual

capacity.

- x. The conceptual gap proposed here is therefore narrower than the original manuscript suggested. The gap is not the absence of a workload-capacity perspective in prevention; prevention burden already provides such a perspective. Rather, the gap is the absence of a dementia-prevention-specific construct that specifies the capacity required to manage a portfolio of midlife dementia-risk-reduction activities and decomposes that capacity into recognition, integration, prioritisation, implementation, adaptation and sustainability. The paper presents this as a theoretical extension requiring empirical comparison with existing constructs.
- xi. multidomain dementia-prevention trials;
- xii. intervention adherence research;
- xiii. health-literacy, self-efficacy and behaviour-change theory (including the COM-B model); and
- xiv. workload-capacity models of chronic-disease self-management, including the Cumulative Complexity Model and minimally disruptive medicine.

The central contribution of this paper is a shift in the conceptual unit of analysis used to think about dementia prevention. Population-level and epidemiological models describe which risk factors are potentially modifiable and what reduction in those risks might achieve [20]. Prevention-burden scholarship adds the important observation that asking people to address multiple risk factors creates work and that capacity is unequally distributed. MPC builds on these foundations by asking what specific capacities are required when a midlife adult must manage a portfolio of dementia-prevention activities over time.

The distinction is therefore not between 'risk factors' and 'capacity' as competing explanations. Rather, risk-factor evidence specifies the content of prevention; prevention burden describes the demands generated by that content; and MPC proposes a capacity-side construct for understanding how those demands are recognised, integrated, prioritised, implemented, adapted and sustained. This creates a potential bridge between epidemiological prevention evidence and behavioural implementation.

The 2024 Lancet Commission identifies a broad and evolving set of potentially modifiable dementia-risk factors. Multidomain intervention evidence demonstrates that prevention can involve several simultaneous activities, while adherence research suggests that intervention complexity and intensity can affect participation. The conceptual question raised by MPC is therefore not whether comprehensive prevention is desirable, but how comprehensive prevention can be made manageable and sustainable for people living within real-world constraints.

This framing may also have implications for equity. If preventive capacity depends partly on time, money, access, social support and environmental conditions, then the ability to act on prevention guidance is not distributed evenly. Prevention-burden scholarship explicitly highlights these contextual and structural dimensions. MPC retains that contextual orientation rather than locating

responsibility solely within individual motivation.

The 2024 Lancet Commission identifies a substantially broader set of potentially modifiable risk factors than earlier prevention frameworks, which represents important progress, yet a larger prevention landscape inevitably raises questions concerning prioritisation, implementation and sustainability. Multidomain intervention evidence further demonstrates that prevention can involve numerous simultaneous activities, while adherence research suggests that complexity and intensity can influence participation, echoing findings from the treatment-burden literature in multimorbidity. MPC therefore provides a possible bridge between epidemiological evidence and behavioural implementation, asking not simply whether an action is beneficial but whether the person has sufficient capacity, support and contextual opportunity to incorporate that action into everyday life.

The proposed model has several strengths, although its main contribution is extension and specification rather than invention. First, it applies established workload-capacity reasoning to a prevention context in which people are typically asymptomatic and managing probabilistic future risk. Second, it places the management of prevention itself at the centre of analysis. Third, it treats midlife as a context in which epidemiological opportunity, competing responsibilities and prevention demands intersect. Fourth, it explicitly differentiates MPC from health literacy, self-efficacy and COM-B while positioning prevention burden as a closely related demand-side construct. Fifth, it incorporates relational and structural conditions rather than treating capacity as purely individual. Sixth, it decomposes the proposed capacity into six dimensions that can be operationalised and empirically tested.

Most importantly, Emblemssvåg & Emblemssvåg, explains the model poses a question that conventional risk-factor frameworks do not fully answer: how can multiple prevention opportunities be made manageable enough to be sustained? The question is deliberately modest [21]. The paper does not claim that prevention is inherently too complicated, that prioritisation is always superior to comprehensive prevention, or that MPC predicts dementia outcomes. It proposes a framework for investigating those possibilities.

19. Limitations

Several limitations should be acknowledged. First, MPC has not been empirically validated. Second, its boundaries relative to prevention burden, patient capacity, health literacy, self-efficacy, behavioural capability, executive functioning, social support and socioeconomic resources remain to be demonstrated. Third, prevention burden is an established but still developing concept, and the present paper should not imply that it originated here. Fourth, the model does not demonstrate that increasing MPC reduces dementia incidence, and it does not establish that prioritised prevention is superior to comprehensive multidomain prevention. Fifth, the proposed relationships may vary according to socioeconomic circumstances, culture, healthcare systems,

disability, comorbidity and other contextual factors. Sixth, the conceptual synthesis was purposive rather than systematic, so relevant literature may not have been identified.

The purpose of the paper is therefore not to claim that MPC is without precedent. Its claim is more specific: adapting workload-capacity reasoning to the management of midlife dementia risk, while explicitly distinguishing the proposed capacity construct from the established prevention-burden literature, may provide a useful theoretical direction for dementia-prevention research.

20. Future Research

The first research priority is constructs validation. A future MPC instrument could assess recognition, integration, prioritisation, implementation, adaptation and sustainability. Research should determine whether MPC is statistically distinguishable from prevention burden, health literacy, self-efficacy, knowledge, behavioural intention, social support, socioeconomic resources and existing patient-capacity measures. A particularly important test would be whether MPC predicts preventive behaviour or maintenance after accounting for these related constructs.

A second priority is testing prevention complexity. Studies could experimentally vary the number, sequencing or complexity of prevention recommendations and examine whether MPC moderate's adherence or sustainability [22]. This would extend the adherence findings from multidomain dementia-prevention trials Coley into a direct test of the proposed capacity-complexity relationship. A third priority is longitudinal research examining whether MPC changes when work, family, finances, health or social circumstances change. Such research would test the claim that preventive capacity is dynamic rather than a fixed personal trait.

A third priority is longitudinal research examining whether MPC changes when work, family, finances, health or social circumstances change. Such research would test the claim that preventive capacity is dynamic rather than a fixed personal trait. A fourth priority is examining equity. If MPC is partly produced by relational and structural resources, interventions that improve access, reduce financial or time barriers, simplify recommendations or provide social support could be evaluated as potential capacity-enhancing strategies.

Dementia prevention has entered an increasingly comprehensive era, with evidence supporting attention to multiple potentially modifiable risk factors across the life course, including important exposures during midlife. The next conceptual challenge may therefore be not simply identifying additional risks, but understanding how people manage the prevention work generated by risks already identified.

This paper has argued that expanding prevention knowledge creates a potential double effect: it opens more routes to risk reduction while potentially increasing the number and complexity of decisions that individuals must coordinate. The Midlife Dementia

Risk-Management Paradox names this tension. It is not a claim that more knowledge is harmful, but a proposition that prevention opportunity and prevention manageability may not expand at the same rate.

In response, the paper proposes Midlife Preventive Capacity (MPC): the dynamic capacity, supported by relevant relational and structural resources, to recognise, integrate, prioritise, implement, adapt and sustain multiple dementia-prevention activities within the circumstances of midlife. MPC is not presented as an entirely novel theory detached from existing scholarship. It extends workload-capacity reasoning from chronic-disease self-management and builds alongside the established concept of prevention burden into the specific context of pre-diagnosis dementia-risk management.

The proposed contribution is therefore a conceptual bridge: risk-factor evidence identifies what prevention may involve; prevention burden identifies the work prevention can impose; and MPC specifies a provisional capacity construct for studying how that work is coordinated and sustained. Its value will depend on empirical testing, particularly whether MPC can be operationalised, distinguished from existing constructs and shown to explain meaningful variation in preventive behaviour. If those tests are successful, preventive capacity may provide a useful missing layer between knowledge of dementia risk and the sustained management of that risk.

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