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✦Review article

Relationship between Purpose in Life and Executive Functions in populations with neurodegenerative conditions or preclinical cognitive risk: a scoping review

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Abstract

Purpose in Life (PiL) refers to a self-organizing life aim central to a person's identity in relation to personal, occupational, and lifestyle domains. Executive Functions (EF), which support planning, reasoning and problem solving are essential to goal-directed behavior and everyday adaptation. Both PiL and EF are central to human functioning during the lifespan, and are particularly relevant in the context of neurodegenerative diseases, where changes in cognition and psychological resources are pronounced. This scoping review synthesized empirical studies examining the association between PiL and EF in populations with neurodegenerative conditions or preclinical cognitive risk. Inclusion criteria comprised empirical, peer-reviewed studies published between 2015 and 2025 in English or Spanish. No restrictions were applied regarding geographical location or cultural background. Three studies met inclusion criteria and were analyzed according to their conceptualization and measurement of both constructs. Findings suggested that associations between PiL and EF may be influenced by the degree of neurological impairment, as well as by differences in measurement approach. However, heterogeneity in metrics and conceptual approaches limits comparability across studies. Further research is needed to clarify the mechanisms

underlying this association and to inform future interventions in preventive and clinical contexts targeting psychological well-being.

Introduction

Well-being has been understood as a multifaceted construct related to living in accordance with one's potential and experiencing one's life as enjoyable, satisfying and fulfilling (Willroth et al., 2024). This construct has been conceptualized from multiple frameworks developed in subfields of psychology such as psychoanalysis, developmental psychology and humanistic psychology. All these perspectives were a foundation that led to a convergence on well-being as a global construct from which multidimensional models emerge.

As the general interest in well-being has grown over the last decades, an increasing number of studies have explored its relationship with overall health and its potential role as a protective factor against diseases such as dementia. Findings from meta-analyses reported a significant association between higher Purpose in Life (PiL) and reduced risk of all cognitive impairment outcomes (Bell et al., 2022), interventions suggest that enhancing PiL may foster healthier cognitive functioning (Sutin et al., 2024). This implies that PiL provides a sense of goal-directedness and future orientation that may nurture psychological resources, such as planning and behavioral regulation, that may mitigate cognitive decline (Sutin et al., 2018).

PiL is a self-organizing life-aim that is central to an individual's identity and serves as a motivational framework for the investment of time, energy, and resources. It entails sustained, long-term commitment to personally meaningful goals that progressively orient the individual toward the realization of this purpose across personal, social, occupational, and lifestyle domains (Kashdan et al.,2024). A prospective study found that PiL is associated with healthier cognitive functions even up to 28 years later, suggesting that people with reduced sense of purpose, especially in their 60s and beyond, and those whose purpose declines more rapidly have a higher likelihood of having dementia by age 80 (Sutin et al., 2024). Given that executive functions (EF) are essential to goal-directed behavior and everyday adaptation, they may represent a key cognitive domain through which PiL connects to overall health.

EF are higher-order mental capacities used in complex activities and related to an individual's level of independence in day-to-day activities. This capacity allows us to understand and synchronize our thoughts successfully (Idowu et al., 2024). According to Diamond's model, there are three core EF components: inhibition, working memory, and cognitive flexibility. This core supports higher-level processes such as planning, reasoning, and problem-solving (Diamond, 2013). Given that EF dysfunction may affect some cognitively demanding activities (Corbo & Casagrande, 2022), it is relevant to examine whether changes in EF are already associated with variations in psychologically meaningful outcomes such as PiL. This emphasizes the role of neuropsychological assessment to better identify early functioning decline in aging (Raimo et al., 2024).

Both PiL and EF are central to human functioning during the lifespan and are particularly relevant in the context of neurodegenerative diseases, where changes in cognition and psychological resources are pronounced. Understanding how both constructs interact in these conditions may inform interventions and guide research. However, the existing literature is conceptually and methodologically heterogeneous, and no comprehensive synthesis has mapped these constructs within this population. Given the exploratory nature of the field, a

scoping review is the most appropriate methodological approach to identify, map, and characterize the available evidence.

This review aims to synthesize the literature examining the relationship between EF and PiL in individuals who are at risk or already affected by neurodegenerative diseases, including conditions considered associated with future cognitive decline. Specifically, the review will identify and describe the populations studied, the conceptualization and measurement of both constructs, and the context in which the studies were conducted. These objectives will contribute to clarifying the current knowledge gaps and the potential role of these constructs in human wellness and cognitive performance.

Methods

This scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols extension for Scoping Review (PRISMA-ScR) (Tricco et al., 2018) to support transparency and reproducibility. This checklist can be found in Appendix 1. Eligibility criteria were developed using the population, concept, and context (PCC) framework. The population of interest included individuals at risk or affected by neurodegenerative diseases (NDs), such as Alzheimer's disease, Parkinson's disease, Huntington' disease, mild cognitive impairment, and frontotemporal dementia or conditions associated with cognitive decline.

Sutin et al. (2021) was retained because it examined Motoric Cognitive Risk syndrome (MCR), a pre-dementia condition characterized by the co-occurrence of subjective cognitive complaints and slow gait. MCR has been consistently associated with increased risk of dementia, cognitive decline, and adverse aging outcomes, making it a clinically relevant marker of preclinical neurodegenerative vulnerability. Although not a formal neurodegenerative diagnosis, MCR falls within the scope of this review because it identifies individuals at elevated risk for future cognitive decline and neurodegenerative progression (Lim et al., 2024; Xiang et al., 2022).

EF was defined broadly, encompassing both core components such as inhibition, working memory, and cognitive flexibility, and higher-level functions including planning, reasoning, and problem solving. Although Diamond's framework was used to define the core and second-level components of EF, attentional control was included as a search term to increase sensitivity because, in aging research, inhibitory control is described as a multidimensional process supported by frontoparietal and ventral attentional networks. In this sense, attentional control was treated as a conceptually related term within the broader inhibitory-control domain rather than as an additional EF component (Kang et al., 2022).

Operationalization of PiL and related constructs

Given the heterogeneity of measurements used for PiL, studies were eligible if they assessed this construct directly or used a closely related purpose or meaning-based construct. Measures of general quality of life were retained as a supplementary search term to increase sensitivity and capture disease-specific patient-reported outcome measures in which meaning, purpose, or well-being may be represented as related domains. These terms were only used to broaden retrieval of potentially relevant studies and were not considered conceptually equivalent to PiL.

During data synthesis, studies were classified as using either direct or related measures of PiL. Only direct measures were interpreted as evidence of PiL, whereas findings derived from related constructs were interpreted as adjacent evidence. Studies were excluded when the population fell outside the scope of this review, when the outcomes assessed were not relevant to the PiL-EF relationship, when the article did not report original empirical data, or when the instrument used did not assess the constructs of interest.

Inclusion criteria comprised empirical, peer-reviewed studies published between 2015 and 2025 to capture recent advances in the conceptualization and measurement of PiL and EF, as well as contemporary research on neurodegenerative diseases. Only studies published in English or Spanish were included, reflecting the language proficiency of the author and the prevalence of research in these languages. No restrictions were applied regarding geographical location, cultural background, or study setting.

The search was carried out in PubMed/MEDLINE, Web of Science, Embase, and LILACS. These databases were selected to ensure wide coverage of information. No grey literature or unpublished data were considered. Backward citation searching was not performed because the review was intentionally restricted to database-indexed, peer-reviewed literature; however, this may have limited the identification of additional relevant studies. This approach was considered sufficient to capture the available literature within the predefined scope and maintain transparency and consistency in study identification. The final search was conducted on October 7 and 8, 2025. The search strategy was first developed for PubMed and adapted to other databases to account for variations in indexing and syntax. Controlled vocabulary terms and free-text terms were combined as follows:

> ("Purpose in Life"[MeSH] OR "purpose in life"[tiab] OR "sense of purpose"[tiab] OR "meaning in life"[tiab] OR "quality of life"[tiab]) AND ("Executive Function"[MeSH] OR "executive function"[tiab] OR "executive functions"[tiab] OR "executive control"[tiab] OR "cognitive control"[tiab] OR "cognitive flexibility"[tiab] OR "inhibition"[tiab] OR "working memory"[tiab] OR "attentional control"[tiab] OR "planning"[tiab] OR "problem solving"[tiab]) AND ("Neurodegenerative Diseases"[MeSH] OR "neurodegenerative"[tiab] OR "dementia"[tiab] OR "Alzheimer Disease"[MeSH] OR Alzheimer*[tiab] OR "Parkinson Disease"[MeSH] OR Parkinson*[tiab] OR "Mild Cognitive Impairment"[MeSH] OR "mild cognitive impairment"[tiab] OR "Frontotemporal Lobar Degeneration"[MeSH] OR "frontotemporal dementia"[tiab] OR "Lewy Body Disease"[MeSH] OR "Lewy body"[tiab] OR "Huntington Disease"[MeSH] OR Huntington*[tiab] OR "Amyotrophic Lateral Sclerosis"[MeSH] OR "atrophy"[tiab]) NOT ("systematic review" OR "review" OR "meta-analysis")

Filters were applied to limit results to studies published between 2015 and 2025, English or Spanish publications, Humans, and articles types excluding comment, congress abstracts, and letters. Study screening and selection were conducted by a single reviewer, which may have increased the risk of selection and classification bias. All identified articles were imported by the author into the Rayyan online screening platform. Duplicates were removed and the remaining studies were screened in two stages: title/abstract and full-text review. A study selection flow diagram of the data extraction process can be found in Figure 1.

Reasons for exclusion were documented as follows: studies conducted in populations outside the scope of the review, studies that did not assess the PiL-EF relationship, background or non-empirical articles that provided context or theoretical information (e.g., narrative overviews, theoretical papers, editorials), and studies that used instruments or outcomes not compatible with the review question. Data extraction was initially assisted by artificial

intelligence tools (ChatGPT-5.3 and Perplexity) using an author-developed extraction form to capture predefined study characteristics and outcome data. All extracted information was then manually verified against the source articles by the author for accuracy and consistency. Any discrepancies were resolved through direct comparison with the original text. This review was not preregistered.

Consistent with the scoping review methodology, no formal quality assessment or risk of bias evaluation was conducted. The following data items were extracted from each included study: bibliographic and publication information, studies characteristics (settings, design, methodology), sample characteristics, conceptualization, measurement of PiL and EF, and main results. The complete information matrix is provided in Appendix 2.

Given the exploratory nature of this review, the synthesis focused on mapping and summarizing the available evidence rather than conducting a quantitative meta-analysis. Findings were synthesized descriptively according to the conceptualization and measurement of PiL and the assessment and domains of EF. The nature of the reported relationships between PiL and EF across studies was also considered to generate an overall summary of the evidence. This approach allowed the identification of patterns, consistencies, and gaps in the literature.

Results

Characteristics of included studies

In total, 355 papers were found (PubMed n = 195; Web of Science n = 115; Embase n = 19; LILACS n = 26). After removing duplicates 339 articles were identified and screened for eligibility. 58 articles were selected after screening the titles and abstracts. Finally, and after the full-text assessment phase three articles were retained for review. These studies encompassed publication dates from 2019 to 2024. Sample size ranged from 102 to 12,450. Population-based studies include diverse racial/ethnic groups (e.g., Hispanic/Latino, White, African American), and average education ranges from secondary to university-level. Cross-sectional and longitudinal studies were used regarding methodological approaches. In terms of the assessment environments the most common was hospital outpatient setting for clinical samples and home/community interviews for large-scale epidemiological studies. The studies selected originate primarily from the United States (n= 2) and Spain (n=1). The available evidence was mainly observational: one cross-sectional studies with large community samples, one prospective 24-month longitudinal study in a clinical population, and one multi-cohort study combining cross-sectional and longitudinal analyses across two independent national samples. The main characteristics of the selected studies are presented in Table 1 summarizing the study details, sample size, constructs measurement tools, and main results.

Conceptualization of Purpose in Life

The studies selected included components of PiL that encompass psychological well-being that captures the extent to which individuals experience meaning, direction, and a sense of orientation in life with manifestations at both the affective level (e.g., happiness and interest) and the behavioral level (e.g., engagement in valued and motivationally significant activities).

Components of this construct include a cognitive dimension: feelings and perceptions of life meaning (Pérez-Pérez et al., 2024; Ready et al., 2019), directional dimension: goal orientation and life direction (Sutin et al., 2021a), and affective dimension: positive emotional experiences associated with purpose (happiness, contentment, interest) (Ready et al., 2019).

Measurement Instruments for Purpose in Life

The studies used both direct measures of PiL and related positive psychological or well-being measures. Among the direct measures the Riff Purpose in Life subscales (7 items) used in HRS showed acceptable internal consistency (α = 0.74), although abbreviated versions have reported limitations in factorial validity, which constrains standalone interpretations (Sutin et al., 2023; Sutin, Luchetti, Gamaldo, et al., 2024). The single-item measure used in NHATS ("My life has meaning and purpose") represents a pragmatic, low-burden option for large epidemiological studies, with moderate test-retest reliability ($r \approx 0.68–0.74$), and expected convergent validity, but its narrow conceptual breadth limits the scope of interpretations (Kim et al., 2016; Sutin et al., 2023). Overall, multi-item direct measures of PiL showed strong conceptual coverage, whereas abbreviated and single-item measures offered lower burden but narrower construct scope.

In contrast, related constructs included the Neuro-QoL Positive Affect and Well-Being (PAW) scale and HDQLIFE Meaning and Purpose. The Neuro-QoL (PAW) scale showed a robust unidimensional structure (CFI = 0.99), very high internal consistency (α = 0.94–0.95), and good test-retest reliability, along with strong convergent validity against mental health and quality-of-Life measures (Salsman et al., 2013). Similarly, HDQLIFE (M&P) developed for Huntington's disease, reported excellent factorial indices (CFI = 0.99; TLI = 0.98), good reliability (α = 0.84–0.87; ICC = 0.86), and convergent validity with other well-being measures, supporting its use in specific clinical contexts (Carlozzi et al., 2016, 2019). Accordingly, the overall pattern of associations should be interpreted with caution as part of the available evidence reflects related constructs such as positive affect and well-being rather than PiL per se.

Assessment of Executive Functions

Assessment of EF also showed substantial methodological heterogeneity. Studies employed objective neuropsychological measures: Stroop Color Naming, Stroop Word Reading, Digit Symbol Substitution Test, Symbol Digit Modalities Test, Word Fluency Test, Modified Telephone Interview for Cognitive Status, backward counting, memory recall, orientation, and clock drawing. As well as subjective instrument: Neuro-QoL Applied Cognition-Executive Function scale. Evaluated executive domains included working memory, cognitive flexibility, inhibitory control, processing speed, and verbal fluency.

Relation between constructs

Findings were synthesized to the type of construct assessed. Studies using direct PiL measures were interpreted separately from studies using related constructs. The longitudinal study by Ready et al., involving 322 patients at various stages (premanifest, early-stage and late-stage) with Huntington's disease reported a moderate baseline correlation between positive affect/well-being and self-reported EF ($r = 0.30$, $p < 0.01$). This study identified a moderating effect of functional status (Functional Assessment × Positive Affect and Well-being interaction:

t (546) = 2.02, p = 0.04) showing that positive affect protected EF only among participants with higher functional capacity, whereas this protective effect was absent in those with lower functioning. Pérez-Pérez et al. in a sample of 102 Spanish patients with Huntington's disease, found weak or non-significant associations between Meaning and Purpose and objective measures of EF. The only significant correlation was with the Symbol Digit Modalities Tests (r = 0.203, p = 0.044), indicating a small effect. Meaning and Purpose was associated with stigma, hopelessness, and depression.

Sutin et al. provided evidence from two independent national cohorts of older U.S. adults: The Health and Retirement Study (HRS; n= 6,785) and the National Health and Aging Trends Study (NHATS; n= 5,665). In this study, higher PiL was associated with lower odds of concurrent Motoric Cognitive Risk (MCR) syndrome (OR = 0.75, 95% CI 0.62 –0.90, p = 0.002) and with a lower hazard of incident MCR over time (HR = 0.77, 95% CI 0.70–0.84, p < 0.001). These associations were replicated across both cohorts and remained statistically significant after adjustment for sociodemographic characteristics, physical health, depressive symptoms, and baseline cognition.

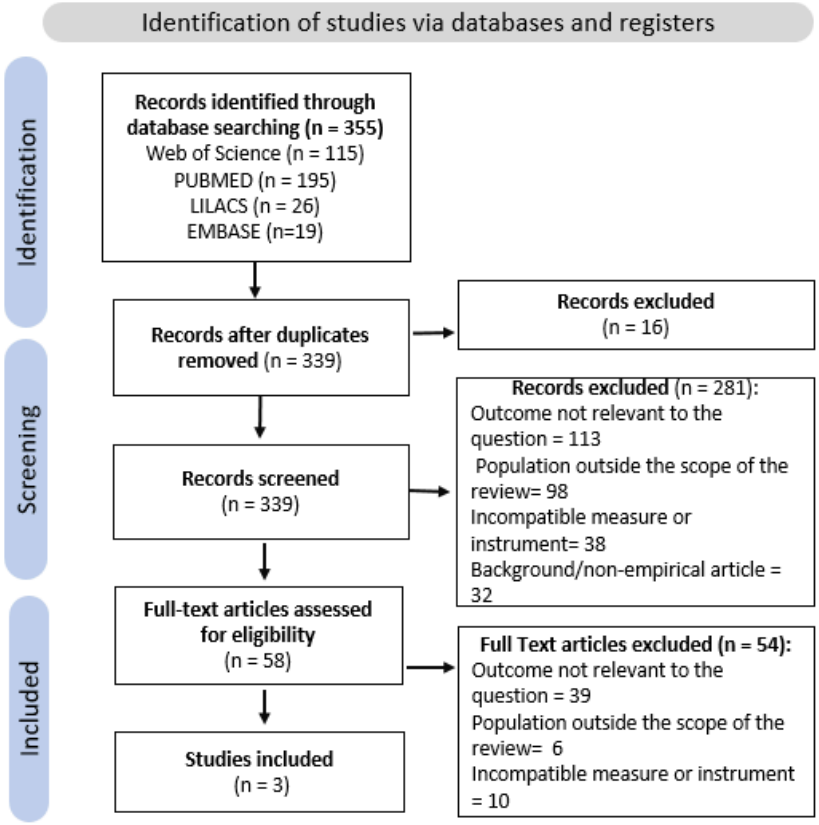

Figure 1. PRISMA flow diagram. Summary of search

The available evidence suggests that direct measures of PiL and related purpose-oriented constructs may be positively associated with cognitive and executive outcomes (Pérez-Pérez et al.,2024; Ready et al., 2019; Sutin et al., 2021). Across the included studies, PiL was consistently operationalized as a multidimensional construct encompassing meaning-making, goal orientation, and engagement in valued activities. This conceptualization aligns with contemporary frameworks in positive psychology and the neuroscience of aging, which position PiL as a psychological resource potentially linked to cognitive health and well-being in

older adults (Bartrés-Faz et al., 2025; Bell et al., 2022; McDonough et al., 2022; Rolandi et al., 2024; Vasileiou et al., 2025).

The pattern of findings indicates that the association between PiL and EF may vary depending on clinical context. In community-based and less clinically impair samples, higher levels of PiL were associated with more favorable cognitive indicators and lower risk of adverse cognitive outcome. In contrast, findings in populations with established neurodegenerative diseases were less consistent, with weaker or non-significant association observed for objective measures of EF. This variability suggests that the association between both constructs may be influenced by the degree of neurological impairment, as well as by differences in measurement approach. Notably, evidence from Sutin et al. extends this association to a preclinical risk state (Motoric Cognitive Risk syndrome), indicating that PiL may be linked to cognitive vulnerability prior to the onset of clinically manifest neurodegenerative disease.

From a clinical perspective, these findings suggest that PiL may provide complementary information within broader neuropsychological assessments, particularly in aging populations. However, the current evidence does not support definitive conclusions regarding its role as a protective or modifying factor, nor does it provide direct evidence for the effectiveness of interventions targeting PiL, although this remains an important question for further research.

Table 1. Studies summary.

Study	Year	Country	Sample n	PiL instrument	EF instrument	Statistical significance	Key finding
Ready et al.	2019	United States	322	Neuro-QoL (PAW) (Related measure) HDQLIFE (M&P) (Related measure)	Neuro-QoL (ACEF- SR)	Baseline r=0.30, p<0.01; Interaction p=0.04	Positive effect protects executive function in HD patients but only for those with higher functional status; benefit decreases at lower functioning levels.
Pérez-Pérez et al.	2024	Spain	102	HDQLIFE (M&P) (Related measure)	Stroop (CN & WR) SDMT	Only SDMT: r=0.203, p=0.044 (significant, weak positive). Stroop tests non-significa nt (p>0.1).	Meaning and Purpose correlated strongly with life satisfaction (r=0.609, p<0.0001) but weakly or not with EF. Stigma, hopelessness, and depression most associated with QoL. Focused on patient reported outcomes, not direct EF – PiL.
Sutin et al.	2021	United States	12,450	PiL (7 item) (Direct measure) Single item (Direct measure)	Modified TICSm MR – O – CD	Cross-section al: OR=0.75 (95% CI=0.62–0.9 0, p=0.002). Longitudinal: HR=0.77 (95% CI=0.70–0.8 4, p<0.001).	Higher purpose linked to ~25–33% lower MCR risk across cohorts; associations robust across demographics and health controls; purpose may protect against cognitive decline and dementia.

Note: Neuro-QoL (PAW) = Positive Affect and Well-being scale; HDQLIFE (M&P) = Huntington Disease quality of life Meaning and Purpose domain; Neuro-QoL (ACEF- SR) = Applied Cognition-Executive Function scale (self-report); Stroop (CN) = Color Naming, (WR)= Word Reading; SDMT= Symbol Digit Modalities Test; PiL = 7-item Purpose in Life scale; TICSm= modified telephone interview for cognitive status; MR – O – CD = memory recall, orientation, clock

draw.

Overall, these findings should be interpreted cautiously. The review included a small number of studies, which differed substantially in design, population characteristics, and measurement of both PiL and EF. This heterogeneity limits comparability across studies and precludes firm conclusions regarding causality, directionality, or the strength of the observed associations. Future research should prioritize longitudinal and experimental designs to clarify temporal dynamics and potential causal pathways, incorporate both direct and conceptually related measures of PiL, and include objective neuropsychological outcomes. Improving conceptual and measurement consistency will be essential to advance understanding of the relationship between PiL and EF and to determine its potential relevance for clinical and preventive contexts.

Limitations

This review has several limitations. First, it was not preregistered, and study selection was made by a single reviewer which may have increased the risk of selection and classification bias. Second, only three studies met the inclusion criteria, and they were methodologically heterogeneous in sample size, design, follow-up period, and measurement of both constructs. This limits comparability and the ability to draw generalizable conclusions. Third, the directionality of the association remains unclear as the observed relationship may reflect either a contribution of PiL to EF or the reverse. Four, the absence of backward citation searching may have limited the identification of additional studies that were not indexed in the selected databases or were not retrieved through the final search strategy. Finally, the evidence was concentrated mainly in U.S. samples, with only one study from Spain, which limits the geographical and cultural generalizability of the findings.

Conclusions

The evidence indicates a possible association between PiL and cognitive or execution outcomes in populations with or at risk for neurodegenerative conditions. However, the limited number of studies, substantial methodological heterogeneity, and variability in construct operationalization preclude definitive conclusions. Overall, the current literature is insufficient to establish a consistent and robust relationship. Future longitudinal studies with clearer conceptual and methodological consistency are needed to clarify the strength, direction, and clinical relevance of these associations.

Competing interests

The author declares having no potential conflicts of interest.

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Declaration of generative AI

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checking. The output was used to draft the Excel data matrix and improve grammatical accuracy and sentence structure in this manuscript. Although AI tools were used, the author remains the sole author of this article and takes full responsibility for its content.

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Appendixes

Appendix 1. PRISMA protocol extension for Scoping Review (PRISMA-ScR)
PRISMA-ScR checklist

Appendix 2. Data extraction matrix for the included studies
Data matrix