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Maladaptive Metacognition, Coping, and Resilience in Diabetic Versus Non-Diabetic Elderly Individuals

Garima Gupta

Assistant Professor, Department of Psychology, Arya Mahila P.G. College (Admitted to the Privileges of Banaras Hindu University), Chetganj, Varanasi (Uttar Pradesh) India

Abstract

Metacognition denotes people's awareness and regulation of their cognitive processes and behaviours. Maladaptive metacognitive beliefs are characterized by excessive worry, negative beliefs about thoughts, and heightened self-monitoring. It can impair effective coping and reduce adaptive capacity. Understanding its significance in later life is crucial, as compromised metacognition may lead to inappropriate evaluation and reduced psychological functioning. Older people generally face multiple-age related difficulties such as detrimental health, loss of loved ones, and evolving societal responsibilities which put demands on cognitive and emotional regulation. Thus, these dysfunctional metacognitive patterns may heightened stress leading to maladaptive coping and lower resilience. With this background, the current study sought to investigate differences in maladaptive metacognition, coping mechanisms, and resilience among diabetes and non-diabetic elderly individuals. Employing a comparative research design, older persons with and without diabetes were assessed using standardised tools of metacognition, coping strategies, and resilience. The results indicated that older individuals (with diabetes) had markedly higher maladaptive metacognitive beliefs and a stronger dependence on maladaptive coping strategies, including diminished resilience, in comparison to their counterparts. These observations highlight the psychological burden in older individuals with diabetic at one hand and on other, it emphasises the significance of higher-order cognitive vulnerabilities along with coping processes. This study stresses the necessity of integrating metacognitive and coping-oriented interventions within psycho-social care framework to improve resilience in older persons, especially those with diabetes.

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Correspondence:
Garima Gupta
grm.gupta2@gmail.com
Assistant Professor, Department of Psychology, Arya Mahila P.G. College (Admitted to the Privileges of Banaras Hindu University), Chetganj, Varanasi-221001 (UP) India

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INTRODUCTION

The process of ageing involves several biological, psychological, and social changes that may challenge an individual's adaptive abilities (Charles & Carstensen, 2010). The global population is ageing alongside rising incidence of Type 2 diabetes (T2D), depicting a significant public health issue (Sinclair et al., 2020). The World Health Organisation anticipates substantial increase in diabetes, with estimates of rising from 171 million in 2000 to 366 million by 2030. According to WHO (2021) Diabetes mellitus, is growing concern as an epidemic in India which significantly affects physical and emotional well-being particularly in older people.

In older age, the burden of chronic illness is high, and conditions with diabetes pose serious physical, cognitive, and emotional demands on sufferers. Beyond its well-known microvascular and macrovascular consequences, diabetes mellitus is related to cognitive impairment, such as forgetfulness and cognitive decline (Janssen et al., 2019; Palta et al., 2017) that may interfere with their daily life. Diabetes is a recognised risk factor for cognitive impairment due to chronic hyperglycaemia and hypoglycaemia, insulin resistance, oxidative stress, and accumulation of beta-amyloid protein in the brain (Biessels & Despa, 2018; Kodl & Seaquist, 2008). Essentially, these neuro-cognitive changes may influence higher-order-function, such as memory-related knowledge, perceptions, evaluations, emotions, and self-regulation (Nelson & Narens, 1994) on which metacognitive functions heavily rely on. Though, these are central to metacognitive monitoring and control processes, indicating that cognitive decline may worsen individual's ability to evaluate, regulate and disengage from maladaptive thinking patterns.

These individuals often experience fear as these symptoms can disrupt or hinder their daily routines. The Self-Regulatory Executive Function (S-REF) model presents an alternative explanation. It posits effective emotional regulation is dependent upon individual's ability for attentional control and metacognitive insight. Diabetes-related impairments in executive functioning may worsen this regulatory mechanism, that increase reliance on cognitive attentional syndrome (CAS), characterised by perseverative worry, maladaptive coping and reduced QOL (Fisher et al., 2018). Due to these deficient cognition, older people may become less able to disengage from internal threatening health related thoughts and beliefs that are dangerously uncontrollable. Therefore, this disease may provide unique convergence of continuous monitoring, increased threat, which together give psychological environment for CAS and emotional difficulties.

Effective diabetic management in older adulthood requires constant self-regulation, decision making and emotional adaptation, imposing significant cognitive and psychological burdens on the individual. While traditional psychosocial models focus on stress and coping processes, metacognitive theory (Well, 2009) offers a complementary framework. It posits that maladaptive patterns of thinking about thinking (e.g., Worrying uncontrollably is dangerous) are more detrimental than the content of thoughts themselves, as they maintained prolonged cognitive attentional syndrome and promote inflexible coping responses. In the context of diabetes, these dysfunctional metacognitions may augment emotional vulnerability that may interfere with managing self successfully.

Maladaptive metacognition and ageing:

Maladaptive metacognition signifies problematic views regarding cognition such as the perception that anxiety is uncontrollable or particular thoughts are dangerous (Wells & Cartwright-Hatton, 2004). These beliefs influence how a person is responding to an internal experience and may intensify anxiety, depression and poor problem solving. Studies suggest that older persons may have alterations in metacognitive processing as a result of cognitive ageing and heightened metacognitive beliefs with increased anxiety and depressive symptoms in later life (Cartwright-Hatton & Wells, 1997). Nevertheless, despite increasing evidences reflecting diabetes with severe emotional distress/burden and cognitive vulnerability, research investigating metacognitive beliefs particularly in diabetic older individuals are still limited compared with non-diabetic people (Hemmingsen et al., 2017).

Coping and Older adults:

Coping involves the cognitive and behavioural techniques utilized by individuals to address internal and external stressors (Lazarus & Folkman, 1984). Coping strategies vary from adaptive (e.g., active problem-solving, positive reframing) to maladaptive (e.g., denial, avoidance). Older person employs a variety of coping mechanisms to navigate life pressures. Aldwin's (2007) life-span theory of coping posits that although older persons often exhibit enhanced emotional regulation, chronic disease may undermine their established coping mechanisms, resulting in a heightened dependence on avoidance or passive coping strategies (Smith et al., 2012). Research (Holahan et al., 2010) has revealed that maladaptive coping predicted poor mental health outcomes in older persons, underscoring the relevance of adaptive coping in ageing populations.

Coping and metacognition are though seeming close but they possess a distinct psychological process. Coping includes both cognitive and behavioural responses to manage stressors, while metacognition involves higher order beliefs that govern how individuals attend to, interpret, and respond to their

internal experiences. Thus, metacognition precedes and shapes coping by determining which coping strategies will be utilised by the person. When older adults think that worry is necessary to control health issues, they may dwell on negative thoughts and focus constantly on possible threats. This reduces the possibility of engaging in adaptive coping strategies and in due course this thinking pattern may lead to rely heavily on maladaptive coping in older adults.

Resilience and older adults:

Resilience is defined as the ability to sustain or restore psychological well-being throughout adversity (Connor & Davidson, 2003). It demonstrates emotional adaptability, use of social support, and skill in handling stressful situations. Resilience has been thoroughly investigated in research; however, studies focusing on resilience in older persons with diabetes are underexplored. Evidence suggests (Lopez et al., 2015) that older persons with diabetes exhibited worse psychological well-being relative to non-diabetics, potentially indicating decreased resilience. Supporting this view, Richardson and colleagues (2017) have demonstrated that coping, self-efficacy and positive metacognitive regulation are significant determinants of resilience among population suffering with chronic illness. Although research on resilience in ageing is expanding, the incorporation of metacognitive and coping frameworks is still an evolving domain.

Within, gerontological research, resilience is matched with successful model of ageing that emphasise adaptation and functional maintenance despite age-related losses (Rowe & Kahn, 1997). In this context, metacognitive skills play a crucial role for stress evaluation and selection of coping strategies, which are core marker of resilience. Elderly people who are metacognitively aware are better at disengaging from unsolvable problems and focus on goals, known as adaptive goal adjustment (Titz et al., 2018). This matches the resilience model of ageing known as, Selection, Optimisation, and Compensation (Baltes & Baltes, 1990). Resilience in old age may be better conceptualized not as "bouncing back" but as "bouncing forward" through metacognition-guided adaptation.

Integration of maladaptive metacognition, coping, and resilience:

Building on this ground, resilience requires a switch between problem-oriented and emotion-oriented coping mechanisms. Studies demonstrate that older persons utilise more proactive, emotion-focused, and accommodating coping mechanisms than younger adults, which improves emotional regulation, a major factor of resilience (Charles & Carstensen, 2010).However, maladaptive metacognitive beliefs (e.g., "Nothing I do will change this") can strengthen evaluations, turning people in passive or avoidant coping patterns (e.g., catastrophic withdrawal) even when problems can be solved. People who think they can't control their thinking avoid cognitive and social challenges. This avoidance hinders getting positive feedback, practicing skills, and getting help, which promote resilience.

These processes are particularly important in the context of diabetes. However, fewer studies have simultaneously investigated metacognitive beliefs, coping strategies, and resilience among older adults with diabetes. The distress of diabetes is reflected in terms of frustrations, fears, worries, and burdens associated with the disease management (Fisher et al., 2012). High distress is a result of poor coping capacity and is more strongly linked to poor glycemic control. Patients often experience "diabetes burnout", a state where exhaustion and disillusionment are high which leads to intentional or unintentional neglect of self-care (Abdoli et al., 2021) representing a collapsible self-regulation. Furthermore, negative metacognitive beliefs (e.g., "Worrying about my blood sugar is uncontrollable") can lock patients into a cycle of anxiety and avoidance, which diminishes the active coping (Wells, 2000).

Collectively these observations suggest a mixed findings about resilience in diabetic individuals. On the one hand, the studies suggest poor resilience among individuals with diabetic, in terms of reduced pro-active coping and deteriorated self-care management, while other research on resilience in diabetics have demonstrated consistent improvement in their behaviour. For example, high levels of general and diabetes-specific resilience are linked to improved HbA1c, self-efficacy, diabetic distress, and self-care (Ruiz et al, 2020; Yi et al, 2008). Resilient people see diabetes care as a challenge, not as a threat. Ehrmann et al. (2017) discovered that older people with greater metacognitive skills (especially executive functions that help them control themselves) manage diabetes better. Metacognitive dysfunctions in mild cognitive impairment (a risk of ageing and diabetes) may hinder self-care. These observations stresses upon the prime role of metacognition and adaptive coping in shaping

resilience outcomes among older adults with diabetes, highlighting the need for integrative models of cognitive, emotional, and self-regulatory processes in the management of chronic illness.

An expanding corpus of research recognises metacognitiveideas regarding one's cognitive processes and coping techniques as essential factors influencing psychological adaptation in later life (Aldwin, 2007; Wells, 2009). Despite the growing acknowledgement of resilience as essential for good ageing, there has been less research explicitly comparing these psychological characteristics between diabetes and non-diabetic older persons. While, cognitive decline is proven in diabetes, but its implication to metacognitive functioning is still scare, converging evidence from neurocognitive and metacognition suggest that dysfunction in executive processes and impaired cognitive flexibility may predispose this population to adopt maladaptive metacognition and reduced self-regulation. Impaired metacognition compromises the self-management, by depleting coping resources, amplifying emotional distress and thus undermining resilience. Not with standing its significance, research on metacognition in chronic physical illness, especially within comparative geriatric cohorts, is also limited. Keeping these all backgrounds in cognizance, this study intends compare older adults with diabetic and non-diabetic on metacognition, coping, and resilience.

Method

Sample: One hundred participants were included purposively in two equal groups: 50 individuals diagnosed with diabetes and 50 non-diabetic individuals. The mean age of the diabetic participants was 65.2 years, while the mean age of the non-diabetic participants was 62.3 years. All the participants were recruited from Varanasi city, Uttar Pradesh. Further, participants in the diabetic group were required to have a formal diagnosis of type 2 diabetes for more than 5 years but not exceeding 15 years. The participants themselves reported to have no other physical or mental comorbidities or self-reported cognitive decline.

Tools:

1. Meta-cognition questionnaire (MCQ-H; Jaiswal et al., 2021) Hindi adaption of the Meta-cognition Questionnaire was used. Based on Cartwright, Hatton, and Wells (2004), the 43-item questionnaire uses a four-point Likert scale from "do not agree" to "strongly agree". Higher score indicates greater maladaptive meta-cognition. The original scale had coefficient alphas for positive beliefs about worry i.e. a thought that worrying will help to cope and solve problem (0.87), negative beliefs about uncontrollability and danger i.e. inability to control thoughts and danger of worry (0.89), cognitive confidence i.e. to have doubts on own memory or cognitive abilities (0.84), superstitions, punishment, and responsibility i.e. beliefs about the need to control thoughts to avert bad outcomes (0.74), and cognitive self-consciousness i.e. awareness of one's thinking process (0.72). The reliability of MCQ-H scale by using split half is 0.829, 0.908 using Cronbach's alpha, and 0.913 using Guttman lambda.
2. Coping behaviour assessment scale (SCBS) was assessed using Hindi adaptation of Brief Cope developed by Janghel and Shrivastav (2017). This scale consists of 28 items, each rated on a four-point Likert scale- "I haven't been doing this at all", "a little bit", "a medium amount", "I have been doing this a lot". The scale captures factors like - problem-focused coping, emotion-focused coping and avoidant coping. The reliability of SCBS scale was found to be 0.82 using Cronbach's alpha.
3. Connor Davidson resilience scale (CD-RISC-25; Rahman & Shahnawaz, 2019) the Hindi adaptation of the Connor Davidson resilience scale was used. The CD-RISC contains 25 items, each rated on a five-point Likert scale, where responses range from "strongly disagree" to "strongly agree". This scale has five factors: positive acceptance of change and secure relationships, trust in one's instincts, tolerance of negative affect and strengthening effects of stress, personal competence, high standards and tenacity, control and spiritual influences. The reliability of the CD-RISC-25 reported 0.90 using Cronbach's alpha.

Procedure:

By using the exclusion and inclusion criteria, person diagnosed with diabetic and control group were recruited. After getting consent, the abovementioned scales were administered. Participants were instructed to answer each item carefully. Each scale was scored based on its strict guidelines mentioned in the manual

Results

Table 1: Difference between maladaptive metacognition, coping and resilience in diabetic and non-diabetic older adults

Variables	t	df	Sig.(2-tailed)	Mean Diabetic	S.D. Diabetic	Mean Non-Diabetic	S.D. Non-Diabetic
Positive Belief about worry	1.673	98	0.098	29.78	8.49	26.90	8.71
Cognitive Self-conscious	0.393	98	0.695	14.24	3.24	13.98	3.35
Cognitive Confidence	5.555	98	**0.000**	22.78	5.48	16.54	5.74
Uncontrollability and Danger	4.950	98	**0.000**	27.12	4.29	22.70	4.62
Superstition, Punishment, Responsibility	2.553	98	**0.012**	13.8400	4.41870	11.6600	4.11374
Overall Metacognition	3.908	98	**0.000**	110.5200	19.98698	94.5200	20.93941
Problem focused coping	-8.358	98	**0.000**	19.6200	4.07025	26.0800	3.64686
Emotion focused coping	-0.884	98	0.379	28.2600	5.18951	29.1200	4.52043
Avoidant focused coping	11.044	98	**0.000**	20.3000	3.33350	13.2000	3.09047
Overall Coping	-0.137	98	0.891	68.1800	8.58497	68.4000	7.43955
Positive acceptance of change and secure relationship	-7.875	98	**0.000**	11.9200	3.20612	16.8400	3.03960
Trust in one's instincts, tolerance of negative affect, and trengthening effects of stress	-6.054	98	**0.000**	15.1600	3.92979	20.2200	4.41375
Personal competence, high standards and tenacity	-6.488	98	**0.000**	20.3800	4.68123	26.3600	4.53449
Control	-4.934	98	**0.000**	7.1400	2.71060	9.5000	2.02283
Spiritual influences	-4.040	98	**0.000**	4.5000	1.85439	5.9400	1.70725
Overall Resilience	-7.986	98	**0.000**	58.6800	12.75745	78.8600	12.51124

The observations from above table suggest that older adults with diabetic have demonstrated increased cognitive confidence, uncontrollability and danger, superstition, punishment, responsibility, overall metacognition compared to non-diabetic older adults. This finding imply that diabetic individuals have more dysfunctional metacognitive beliefs compared to non-diabetic older adults. Further, these diabetic individuals have also reported poor problem-focused coping and greater use of avoidant coping strategy in comparison to controls. These older adults with diabetic have also demonstrated poorpositive acceptance of change and secure relationship; trust in one's instincts, tolerance of negative affect, and strengthening effects of stress; personal competence, high standards and tenacity; control; spiritual influences; and overall resilience.

Discussion

This study provides novel evidence that older adults with T2D exhibited more dysfunctional metacognitive profile i.e. greater use of maladaptive coping and lower resilience compared to their non-diabetic control. These observations suggest that diabetes related cognitive and emotional distress may pose older people at risk for metacognitive vulnerability that leads to poor coping skills and diminished resilience. Older persons with type 2

diabetes frequently encounter cognitive deficits, especially in executive function, memory, and processing speed, attributable to persistent hyperglycemia and vascular alterations impacting the brain. Such cognitive decline impairs functions i.e. planning, self-monitoring, and effective emotional management. In chronic conditions such as diabetes, detrimental metacognitive beliefs (e.g., "I cannot regulate my thoughts regarding my illness") are prevalent, and these beliefs are associated with heightened anxiety and depressive symptoms. Maladaptive metacognitions can hinder the ability to reflect effectively on self-management strategies. Further, The Self-Regulatory Executive Function (S-REF) model elucidates that when an individual perceives worrying or ruminating as uncontrollable or perilous, they engage in recurrent negative thought processes (perseverative cognition) which perpetuate suffering and avoidant oriented coping strategies thereby activating the CAS essentially. In chronic illness like diabetes, stressors are persistent, consistent CAS intensify emotional distress and limits flexible thinking. Therefore, person with diabetes may find it hard to shift their focus from negative illness-related thoughts.

The greater reliance on avoidance-oriented coping in the T2D group aligns with previous findings in chronic illness (Livneh & Wilson, 2020) and may be understood as a behavioural manifestation of the CAS, where worry about disease complications leads to cognitive and behavioural avoidance. According to transactional model of stress and coping (Lazarus & Folkman, 1984), individuals assess stressors and subsequently choose coping techniques. When stress is perceived and control is low (often in case of diabetic situation), individuals are more likely to utilise emotion-focused or avoidant coping. Persistent CAS may further bias these evaluations toward threat, supporting disengaged coping styles.

Research indicates that diabetes discomfort is inversely associated to resilience. Increased distress diminishes confidence in health management and drive to persevere. Diabetes related distress undermines one's self-efficacy which is crucial to resilience. Moreover, Conservation of Resources Model (Hobfoll, 1989) suggest that stress diminishes personal resources, such as energy and self-efficacy. When these resources are constantly depleted, person experiences lesser ability to recover from stress, resulting in reduced resilience.

Conclusion

Older adults with Type 2 diabetes demonstrate distinct psychological vulnerabilities, including elevated maladaptive meta-cognition, greater use of disengaging coping strategies, and lower resilience. Maladaptive metacognition appears to be a potent factor in determining psychological resilience in this population. Taken together, these findings implies that psychological support for older adults with T2D may be enhanced by incorporating metacognitive approaches rather than solely challenging disease-specific thoughts. Therapies like Metacognitive Therapy (MCT) could aim to modify the underlying metacognitive beliefs. With the rapid ageing of population and growing incidences of chronic illness, research in this area is both timely and essential for improving psychological well-being and quality of life in later life.

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