



# TO EXPLORE THE RELATIONSHIP BETWEEN COGNITIVE RESERVE AND COPING STYLES AMONG OLDER ADULTS

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**Abstract:** This study examines the relationship between cognitive reserve and coping styles among elderly people in Coimbatore. The main objective of the study is to examine the levels of cognitive reserve and styles of coping to daily life situations and to examine the relationship between cognitive reserve and coping styles. Second objective is to find the impact of cognitive reserve on coping styles among elderly people. A sample of 91 participants of age category above 60 from Sular Coimbatore was selected based on the researcher's convenience. With the consent of the participants the study proceeded with data collection by using standardized questionnaires such as cognitive reserve questionnaire (CRI- long version) and coping styles. Descriptive statistics, Pearson correlation and independent sample t test was analyzed using statistical programmes for social science. The finding revealed that only minimal correlation was observed to occupation and coping styles among elderly people and no correlation was observed for cognitive reserve and coping styles among elderly people. No difference was found between gender in cognitive reserve and coping styles. These findings result in no relationship between cognitive reserve and coping styles and cognitive reserve has no impact on coping styles.

**Keywords:** cognitive reserve, coping styles, elderly people, CRI occupation, people age above 60

## INTRODUCTION

The process of aging is intricate and varied, encompassing changes in biology, psychology, and society that may have an effect on cognitive abilities. Although cognitive decline is a typical side effect of aging, not everyone exhibits it consistently or to the same degree. As a potential preventive measure against age-related cognitive deterioration, the idea of cognitive reserve (CR) has drawn more and more attention. Delaying the clinical manifestation of thinking deficits, cognitive reserve refers to the brain's propensity for making efficient use of its resources and compensating for damage (Stern, 2002). Higher cognitive reserve is associated with a stronger immune system to the detrimental effects of aging, and has been influenced by persistent involvement with intellectually demanding hobbies, occupation, and education.

### Cognitive reserve

Cognitive reserve is defined as the brain's ability to maintain cognitive functions, finding alternate ways of completing tasks despite brain aging. It is also known to improvise the brain's ability as a result of education, life experience, and engagement in mentally stimulating activities. It is measured by observing indicators such as complexity of job roles, frequency of doing mentally stimulating activities and education level.

### Coping styles

Coping styles refers to some specific, observable and measurable behaviours or strategies where each and every individual tries to manage daily life stressors, adverse situations and challenges. It is also a cognitive pattern as individuals applies different coping styles that depend on situation. Coping tactics in addition to cognitive reserve, are crucial in determining how older individuals manage stress and age-associated issues. The measures that individuals apply for handling stressors have been referred to as coping mechanisms, and they can be either maladaptive or adaptive. Greater mental health and cognitive functioning in elderly individuals have been linked to adaptive coping approaches such as problem-solving and seeking assistance from others (Folkman & Lazarus, 1988). On the contrary hand, maladaptive strategies including denial or avoidance may exacerbate stress and outcome in deteriorated psychological and cognitive outcomes (Aldwin, 2007). Higher cognitive reserve adults are believed to exhibit smaller cognitive decline as well as more utilization of adaptive methods of coping, which could boost their overall mental health. Acceptance the relation amongst these two variables can offer important ideas for interventions geared to foster healthy aging while improving the average level of living among people around 60 and here it also plays a major role in managing daily stressors

## Cognitive Reserve

The capability of the brain for adaptation to injury or age-related changes despite diminishing cognitive function is known as cognitive reserve (CR). First brought up as a justification, the idea clarifies the reason that some individuals with substantial brain illnesses such as Alzheimer's disease, have minimal or no cognitive symptoms, while others with less pathology show notable impairments (Stern, 2002). As defined by Barulli and Stern (2013), cognitive reserve is considered to convey the performance, adaptability, and flexibility of neural networks, providing the brain to repair or make up for damage through employing different pathways or approaches.

Over the course of a life span, an assortment of factors impact our development of cognitive reserve. Greater cognitive reserve is regularly associated with higher educational achievement, intellectually challenging jobs, and engagement in mentally taxing leisure activities (Scarmeas & Stern, 2003). Due to the enhancement of brain plasticity and neurogenesis, bilingualism, routine physical activity, and socializing have also been found to be key variables in the emergence of cognitive reserve (Bialystok et al., 2007; Fratiglioni et al., 2004). Those components work as an armor against an increase of symptoms, facilitating people to maintain their cognitive abilities in the face of both neurodegenerative disorders and aging itself.

In addition, research indicates that interventions may influence cognitive reserve even later in life and that it is dynamic. Cognitive reserve is a tempting focus for interventions scheduled at minimizing the risk of cognitive decline given that it can be improved even more by cognitive training, networking, and lifestyle modifications that support physical health (Valenzuela & Sachdev, 2006). Overall, cognitive reserve operates as a deterrent, boosting the variability in cognitive aging paths and providing a potential path for fostering a healthy old age.

Cognitive reserve parallels the concept of brain reserve in that it is a potential mechanism for coping with brain damage. This provides a good explanation how levels of intelligence, education and occupation plays a role. Studies state that cognitive reserve is a crucial concept for understanding how various lifestyle factors impact aging and how interventions, like mental stimulation and socialization, can promote better cognitive health. Researchers emphasize that building cognitive reserve through lifelong learning staying socially active, engaging in problem solving activities, and physical exercise can help delay or reduce the effects of aging or neurological disease

## Theories of cognitive reserve

Several theories have been developed to explain how these work and how it influences. Here some of the major theories that are discussed

### *Cognitive reserve theory*

It was introduced by Yaakov Stern in the 1990s, this theory states that brain size is not in the focus rather and brain uses the resources available and also it emphasizes the active aspects of reserve, such as neural plasticity, compensation and cognitive strategies. This theory majorly focuses on the brain's ability in utilizing the resources to find alternative ways and the brain has the ability to rewire itself using alternative cognitive strategies to compensate for damage. Cognitive reserve is the ability that can be developed through life experiences, education and social activities.

### *Scaffolding theory of aging and cognition*

This theory was proposed by Denise Park and colleagues, this theory integrates cognitive reserve with scaffolding. Here the brain builds the compensation to neural networks to support cognitive functions. Scaffolding refers to the brain's ability to develop new neural circuits or use alternate strategies to compensate for declining neural structures. This process can be enhanced by social activities, interactions, and physical exercise. It also suggests that as the brain ages, it shifts from using original neural pathways to rely more on compensatory scaffolds. Engaging in mentally challenging activities can help maintain and strengthen these scaffolds, thereby contributing to cognitive reserve.

## The role cognitive reserve across lifespan

Throughout life, cognitive reserve (CR) has an enormous impact on resilience and cognitive health in different manners based upon the stage of life. Although its effects are generally attributed to aging, cognitive reserve influences cognitive function at all seasons of life and begins to develop at young ages.

### *Young Age*

Given that the brain is very adaptable during the early years of adulthood, this is the best moment for the establishment of cognitive reserve. Building cognitive reserve during the school year is mostly dependent on interacting with others, achievement in school, and engagement in intellectually stimulating activities. In the words of Barulli and Stern (2013), these kinds of activities promote synaptic plasticity and the establishment of successful neural networks that support cognitive abilities throughout life. While youngsters may not immediately express cognitive reserve, its build up produces a basis for enhanced cognitive capacity for change and resilience in the future, particularly within circumstances of stress or demanding tasks (Opdebeeck et al., 2016).

### *Middle Ages*

As the brain begins to experience age-related changes in this age group, cognitive reserve starts growing more apparent in sustaining the ability to think. Even while overall may not be any significant cognitive decline at the moment, middle age tends to be when insignificant forgetfulness or decreased processing speed - earlier hallmarks of cognitive aging—begin to be apparent. Better performance on tasks demanding memory, attention, and executive functioning has been associated with higher cognitive reserve (Scarmeas & Stern, 2003). At this point, continuing engagement in social contacts, physical activity, and intellectually communicating activities may help improve cognitive reserve and delay the onset of cognitive decline.

### *Old Age*

As a safeguard against age-related cognitive decline and neurodegenerative disorders, cognitive reserve is of special significance in old age. In spite of similar levels of brain pathology, such as diminution or the formation of plaques and tangles linked to Alzheimer's disease, people with larger cognitive resources usually experience fewer cognitive disabilities (Stern, 2002). This is to ensure that the brain can retain cognitive function through the utilization of compensating techniques or various neural pathways thanks to cognitive reserve. logically, a higher cognitive reserve has been associated with higher standards of life, a



delayed development of dementia symptoms, and a greater capacity for independent enjoyment of everyday tasks (Tucker & Stern, 2011). Even with cognitive challenges like memory loss or diminished executive function, humans with greater cognitive reserve exhibit a slower rate of decline.

### **Cognitive reserve and adaptation to daily life stressors**

Cognitive reserve is not long-lasting and develops over life. It can be strengthened with continuous learning, relationships with others, and preserving a healthy lifestyle. It is therefore an appropriate focus for treatment options designed for boosting cognitive health and mitigating the adverse effects of aging. Across the lifespan, humans experience everyday circumstances involving adaptability. Cognitive reserve, or CR, is vital for this process to occur. Consumers come over cognitive demand in stressful situations, whether they're having to do with work, relationships, health, or various other matters. These kinds of circumstances demand beneficial problem-solving, managing emotions, and decision-making. By establishing the most cognitive resources and applying novel methods of coping, individuals with a higher level of cognitive reserve can be able to manage these stressors more adeptly. Improving cognitive flexibility—the flexibility for switching between multiple duties and thoughts when dealing with challenging or stressful situations—is one of the primary methods through which cognitive reserve facilitates stress adaptations. Through this capacity for change, people with greater cognitive capacities are more inclined to appraise situations with stress properly and use their problem-solving abilities opposed to making the feelings get more out of their minds (Stern, 2002). They can thereby examine multiple possibilities with greater efficiency, keep emotional control, and prevent harmful techniques for coping including rumination or avoidance, which might make stress higher.

In addition, susceptibility to pressure-induced cognitive challenges, such as difficulties with focus and memory lapses, which occur frequently during situations of high stress, is linked to cognitive reserve. Because their brains are more successful at accounting for the ephemeral cognitive disturbances produced by stress, individuals with higher cognitive retains are less likely to develop a significant decline in their mental abilities under stress (Barulli & Stern, 2013). This allows individuals to stay determined and execute out daily responsibilities more efficiently, in particular in the face of hardships. Further, individuals who possess more substantial cognitive reserve are somewhat more likely to use adaptive means of coping like emotions-focused coping, which involves modifying the circumstance or obtaining by social assistance as a way overcome feelings of sadness, or problem-focused coping, and these involves actively attempting to tackle the source of stress (Folkman & Moskowitz, 2004). As they enable individuals to effectively cope with stress without having to respond within its adverse consequences, these approaches have been associated with better psychological outcomes and increased overall wellness. To summarize, cognitive reserve serves as a safeguard towards decline in cognitive function and is essential in enabling individuals in adjusting to both the mental and emotional strains of normal daily activities. Cognitive reserve enhances a person's capacity for sustained emotional and cognitive functioning during stressful situations by promoting flexibility in thinking, control over emotions, and adaptive methods for coping.

### **The Impact of Cognitive Reserve on Leisure Time Activities**

Cognitive reserve (CR) has an enormous effect on the way individuals communicate with and gain joy from leisure activities. Reading, gaining experience with an instrument, working out puzzles, communicating with others, and exercising are examples of leisure pursuits that have been found to be critical to sustaining cognitive health through one's life. These activities produce steady cognitive stimulation which is helpful in preserving and potentially enhancing cognitive reserve, in additionally contributing to developing it. strengthen cognitive functioning (Scarmeas & Stern, 2003).

Higher cognitive reserve individuals frequently seek out and engage in more communal and intellectually demanding recreational pursuits. This is because of the evidence that cognitive reserve correlates to greater flexible thought processes and an expanded range of passions, which inspire individuals to participate in challenging and fascinating pastimes in their free time. Investing in activities that need problem-solving, memory, and creativity, including playing chess, learning a new language, or attending to cultural events, serves as an illustration of the above (Opdebeek et al., 2016). By the cultivation of neuroplasticity and a rise in brain resilience toward cognitive loss caused by age or neuropathological damage, such stimulating pastimes additionally boost cognitive reserve.

Additionally, studies indicate the preventative measures power of leisure activities, primarily those incorporating mental or social contact, against cognitive deterioration in later life. Activities that keep older persons mentally and socially engaged, such as playing cards, playing group sports, or going to social events, are examples of how to maintain cognitive reserve. According to studies, older persons who participate in mentally and socially collaborating leisure activities have a lower chance of cognitive decline and dementia (Verghese et al., 2003). It seems that these physical activities enhance cognitive reserve, which allows the brain to react to age-related changes, and this has a protective consequence. Furthermore, taking part in typical recreational pursuits like dancing, swimming, or walking enhances cognitive reserve. Exercise has been proved to support cognitive reserve by increasing hippocampal volume, facilitating executive function, and promoting memory (Colcombe & Kramer, 2003). Finally, it may be said that cognitive reserve both affects and enhances the cognitive advantages that come from what people choose to do with their free time. In addition to strengthening the protective benefits of cognitive reserve against cognitive decline, cognitive resilience is fostered by leisure activities that test the mind and body.

### **Coping styles**

The cognitive and behavioral strategies that individuals adopt for dealing with stress and challenges in their daily lives are commonly referred to as coping styles. These strategies influence an individual's capacity for coping with difficult situations and serve as crucial for psychological well-being. The term "constantly changing mental and behavioral strategies to manage particular internal and external demands that are perceived as taxing or exceeding the abilities of the person" was first used to describe coping by Lazarus and Folkman (1984). The two main categories of coping styles are maladaptive (or emotion-focused) coping and adaptive (or problem-focused) coping. Older adults encounter an assortment of unique challenges, such as getting worse physical health, losing loved ones, having a smaller number of social networks, and being increasingly reliant on others. How older adults deal with these stressors can have an enormous effect on their psychological health and their general quality of life. Two main types of coping strategies are used by the elderly: problem-focused coping and emotion-focused coping (Lazarus & Folkman, 1984)

### Emotion focused coping

A different kind of adaptive coping is emotion-focused coping, that concentrates on regulating the emotional pain caused due to stress rather than coping with the stressor directly. Minimizing responses to emotions and strengthening coping abilities can be accomplished through utilizing techniques including practicing mindfulness, contacting out for social support, or altering the perspective of an unpleasant situation (Carver & Connor-Smith, 2010). In circumstances where the stressor is unchangeable, like a chronic sickness or a bereavement, emotion-focused coping can be especially helpful. Adaptive coping strategies have been scientifically linked to better mental and cognitive outcomes. As to Baldwin (2007), individuals that engage methods to cope such as problem-solving and positive reinterpretation have been shown to have decreasing levels of anxiety and sadness. likewise older persons who use those methods generally demonstrate increased psychological resilience, allowing them to handle age-related stressors like physical decline and social losses (Gerstorf et al., 2015)

### **Problem focused coping**

The goal of problem-focused coping is to identify the source of stress and make an effort to modify it. For older people, this may involve obtaining support for medical conditions, working out how to get round limits regarding their accessibility, or organizing expenses to make situations fewer undetermined. Due to research, problem-focused coping is not always utilized by older individuals, but when individuals get older, they become less inclined to use it due to social and physical limitations that make it difficult to confront stressors effectively (Aldwin, 2007). But when it pertains to solutions to problems, older persons who practice them report better psychological well-being as well as increased life satisfaction (Gould et al., 2012). This is partly because of the fact that implementing these techniques produces a sense of control over a person's surroundings, which has a connection to positive mental health outcomes.

### **Avoidance focused coping**

Maladaptive ways to cope like avoidance, denial, or rumination may be employed by some elderly individuals regardless of the positive aspects of coping techniques that are adaptive. These techniques have been tied to worse mental health outcomes, such as a greater prevalence of anxiety and depression, and are less effective for alleviating stress (Kraaij et al., 2002). Avoidant coping, for example, may appear in the advantage of giving up on hobbies, cutting off social interactions, or disregarding medical conditions. Any of these behaviors may result in a never-ending cycle of stress and ill-health. At the end of the coping mechanisms have significance to how older individuals manage the difficulties presented with ending up older. Maladaptive strategies for coping frequently exacerbate stress and reduce wellbeing, whereas adaptive techniques, such problem- and emotion-focused coping, support resilience and greater mental health.

## **The Impact of Coping Styles on Cognitive Reserve in Older Adults**

Methods for coping have an important effect on individuals' cognitive reserve (CR) as they affect how they manage stress, recover mental clarity, and take part in mentally demanding activities. Cognitive reserve alludes to the brain's potential to adapt to changes carried on by aging or neuropathology by using other or improved neural pathways (Stern, 2002). The rate by which cognitive aging proceeds can be altered by mechanisms for coping, independent of whether they are categorized as adaptive or maladaptive. Such techniques have a likelihood to enhance or reduce cognitive reserve.

### **Adaptive methods of coping**

By promoting mental involvement, resilience to pressure, and controlling emotions, adaptive methods of coping which include emotion- and problem-focused coping increase cognitive reserve. In order to keep their mental processes functioning and occupied, problem-focused coping encourages older persons to confront hardships head-on and find resolution (Aldwin, 2007). As an example, finding solutions related to everyday tasks, such as administering one's own wellness or economics, implies mental activity, which may foster mental efficiency and flexibility in cognition, consequently sustaining cognitive reserve. Similarly, elderly people can cope with stress without falling into bad emotions through emotion-focused coping, particularly beneficial reappraisal, which may promote cognitive health. Chronic stress is known to have adverse impacts on cognition and cognitive performance; managing emotions assists in minimizing these effects (Lazarus & Folkman, 1984). Emotion-focused coping diminishes psychological anguish, which opens up mental energy that stress may otherwise occupy whilst maintaining the brain flexible and malleable. Studies suggest that positive coping techniques, such as acceptance and social support, have been linked with better cognitive outcomes for older individuals. This happens because these strategies strengthen resilience and boost brain plasticity (Charles & Carstensen, 2010).

In addition, adaptive coping has been linked with additional mentally demanding activities, which are crucial to building and maintaining cognitive reserve. These mental activities, including reading, playing games, picking up new skills, or interacting with individuals, enhance neural connections and promote neuroplasticity (Scarmeas & Stern, 2003). Active techniques for coping are linked with a greater likelihood of engagement in and demand for such activities by elderly individuals, resulting in maintaining their cognitive reserve.

### **Maladaptive Coping**

Maladaptive methods of coping, on the other hand, might decrease cognitive reserve through promoting disengagement from mentally demanding activities and boosting the possibility of associated stress decline in cognition. These might include avoidance, denial, and rumination. Eliminating from challenging or stressful situations represents a type of avoidance coping which can result in diminished cognitive involvement and an absence of mental engagement (Holahan et al., 2005). Because the brain fails to receive enough exercise, this can ultimately lead to an impairment in executive function and flexibility in thinking. In particular, maladaptive methods of coping exacerbated by chronic stress are damaging to cognitive reserve. In line with studies, stress may accelerate the process of aging in people over 60 by weakening the hippocampal neuron, an area of the brain that is essential to memory and learning (McEwen & Sapolsky, 1995). The negative impacts of stress on thinking abilities are more likely to be experienced among individuals who depend upon methods of coping such as emotional avoidance or rumination. Studies show that older adults who use unhealthy ways of coping are at more risk of developing cognitive impairments and memory dysfunctions which results in decreased executive functioning.



### The role of social support

Enhancing social support is essential to enhancing cognitive reserve and is frequently used as an adaptive way to cope. Better cognitive results are usually experienced by older people who actively seek out relationships and emotional assistance from relatives, close companions, and community members (Fratiglioni et al., 2004). Social connections offer mental assistance and stimulation for thought, which may protect against the harmful consequences of stress and assist with maintaining cognitive reserve. According to research, building an extensive social network helps prevent dementia and delay the onset of cognitive loss, particularly with elderly people who have considerable cognitive reserve (Barnes et al., 2004).

In summary, cognitive reserve is significantly impacted by the coping mechanisms employed by older persons to handle stress. Cognitive resilience and mental functioning are preserved and promoted by adaptive coping mechanisms like problem-solving, positive reappraisal, and seeking out social support. On the other hand, maladaptive behaviors like rumination and avoidance can reduce cognitive reserve and accelerate cognitive aging. Maintaining cognitive function in later life requires older persons to be encouraged to keep cognitively active and learn adaptive coping skills.

### NEED OF THE STUDY.

The need to study the relationship between cognitive reserve and coping styles among older adults stems from several important factors related to aging, mental health, and overall well-being. Cognitive decline is a common concern in aging, and exploring ways to maintain cognitive function is essential. Cognitive reserve refers to the brain's ability to cope with age-related changes or damage, allowing individuals to maintain cognitive function longer. Identifying how cognitive reserve develops and can be maintained is key to preventing or delaying cognitive decline. The ability to cope with stress, illness, and age-related challenges is vital for mental well-being in older adults. Studying this relationship can help create comprehensive support strategies for older adults, combining mental health interventions with cognitive training, improving both mental and cognitive resilience during aging.

### RESEARCH METHODOLOGY

The methodology section outline the plan and method that how the study is conducted. This includes Universe of the study, sample of the study, Data and Sources of Data, study's variables and analytical framework. The details are as follows;

#### 3.1 Population and Sample

The sample of the study was selected from Coimbatore. Convenient sampling method was put in action.

#### 3.2 Data and Sources of Data

For this study secondary data has been collected. From the website of KSE the monthly stock prices for the sample firms are obtained from Jan 2010 to Dec 2014. And from the website of SBP the data for the macroeconomic variables are collected for the period of five years. The time series monthly data is collected on stock prices for sample firms and relative macroeconomic variables for the period of 5 years. The data collection period is ranging from January 2010 to Dec 2014. Monthly prices of KSE - 100 Index is taken from yahoo finance.

#### 3.3 Theoretical framework

Variables of the study contains dependent and independent variable. The study used pre-specified method for the selection of variables. The study used the Stock returns are as dependent variable. From the share price of the firm the Stock returns are calculated. Rate of a stock salable at stock market is known as stock price.

Systematic risk is the only independent variable for the CAPM and inflation, interest rate, oil prices and exchange rate are the independent variables for APT model.

Consumer Price Index (CPI) is used as a proxy in this study for inflation rate. CPI is a wide basic measure to compute usual variation in prices of goods and services throughout a particular time period. It is assumed that arise in inflation is inversely associated to security prices because Inflation is at last turned into nominal interest rate and change in nominal interest rates caused change in discount rate so discount rate increase due to increase in inflation rate and increase in discount rate leads decreased cash flow's present value (Jecheche, 2010). The purchasing power of money decreased due to inflation, and due to which the investors demand high rate of return, and the prices decreased with increase in required rate of return (Iqbal et al, 2010).

Exchange rate is a rate at which one currency exchanged with another currency. Nominal effective exchange rate (Pak Rupee/U.S.D) is taken in this study. This is assumed that decrease in the home currency is inversely associated to share prices (Jecheche, 2010). Pan et al. (2007) studied exchange rate and its dynamic relationship with share prices in seven East Asian Countries and conclude that relationship of exchange rate and share prices varies across economies of different countries. So there may be both possibility of either exchange rate directly or inversely related with stock prices. Oil prices are positively related with share prices if oil prices increase stock prices also increase (Iqbal et al, 2012). Atallah (2001) suggested that oil prices cause positive change in the movement of stock prices. The oil price has no significant effect on stock prices (Dash & Rishika, 2011). Six month T-bills rate is used as proxy of interest rate. As investors are very sensitive about profit and where the signals turn into red they definitely sell the shares. And this sensitivity of the investors towards profit effects the relationship of the stock prices and interest rate, so the more volatility will be there in the market if the behaviors of the investors are more sensitive. Plethora (2002) has tested interest rate sensitivity to stock market returns, and concluded an inverse relationship between interest rate and stock returns. Nguyen (2010) studies Thailand market and found that Interest rate has an inverse relationship with stock prices.

KSE-100 index is used as proxy of market risk. KSE-100 index contains top 100 firms which are selected on the bases of their market capitalization. Beta is the measure of systematic risk and has a linear relationship with return (Horn, 1993). High risk is associated with high return (Basu, 1977, Reiganum, 1981 and Gibbons, 1982). Fama and MacBeth (1973) suggested the existence

of a significant linear positive relation between realized return and systematic risk as measured by  $\beta$ . But on the other side some empirical results showed that high risk is not associated with high return (Michailidis et al. 2006, Hanif, 2009). Mollah and Jamil (2003) suggested that risk-return relationship is not linear perhaps due to high volatility.

### 3.4 This study uses two major assessments to investigate the interplay between cognitive reserve and coping styles

#### 3.4.1 Consent form

The consent form hold the ethical measures of the research study where the participant is completely willing to participate in the study with providing confidentiality and a right to relieve from the study if they feel uncomfortable

#### 3.4.2 Socio demographic details

Here this standard section is constructed by the researcher to collect information from the samples which provides the detailed description and also helps in the study. This includes name, gender, age, education, habitat, qualification, occupation and socio-economic status.

#### 3.4.3 Cognitive reserve index

Cognitive reserve index questionnaire is the assessment to measure cognitive reserve for individuals by compiling the information regarding an individual's adult life. It was proposed by Nucci, M., Mapelli, D., & Monidini, S. It is a semi structured interview which contains 20 items that are grouped into three sections such as education, occupation and leisure time activity. Here it has some categories of occupation in which similar cognitive level functions are grouped together and experience is asked to mention. In the same way for leisure time activities four categories namely weekly, monthly annually and fixed frequency levels had been grouped. Scores from three sections are combined to get overall cognitive reserve. Reliability of the scales was 0.78 in cronbach alpha coefficient and inter rater reliability was high.

#### 3.4.4 Coping styles

Coping styles questionnaire was constructed to assess behavioral, cognitive and emotional methods to manage problems. This questionnaire was given by Hamby, Grych & Barnyard in 2013, it was actually adopted from Holahan & Moos, in 1978. It is a 13-item questionnaire and four-point likert scale which consists of both behavioral and appraisal methods of coping. Reliability of the scale was found from pilot studies to adopted questions and resulted in 0.91 coefficient alphas and validity was established in the main study with strong correlations of other factors such as well-being, endurance, post traumatic growth etc.

### 3.5 Procedure

Here in the study, the data was collected through convenience sampling with regard to inclusion criteria and exclusion criteria. With consent from the participants, the data was collected and analysis was done.

### 3.6 Ethical consideration

Informed consent, confidentiality, purpose of the study were explained in detail and rights of participants were also well explained with informed consent the data was collected.

### 3.7 Analysis of data

The collection was analyzed using the SPSS software version 25. Descriptive statistics like mean, standard deviation, frequency and percentage were carried out. Kolmogrov Smirnov test was carried out to check the normality of the data. Student's 't' test was carried out to assess the gender difference while Pearson Product Moment Correlation was used to assess the relationship between the variable

## IV. RESULTS AND DISCUSSION

*Table 4.1 depicts the frequency, percentage, mean and standard deviation of social-demographic variable*

Variables	Frequency	Percentage	Mean	SD
Age	60 - 69	62	68.2	6.992
	70 - 79	20	22	
	80 and above	9	9.8	
Gender	Male	37	40.7	
	Female	54	59.3	
Birth order	First born	28	30.8	
	Second born	36	39.6	
	Third born	27	29.6	
Hospitalized	Yes	46	50.5	
	No	45	49.5	

The table 4. 1 represents the distribution of data collected from the sample which includes socio demographic details such as gender, age, birth order and hospitalization of the sample for any other reason both psychological and physical. The data collected comes under the age of older adults such as above 60 both female and male. Male population is less than female population, while looking into birth order first born, middle born and last born were the groups that are segregated. First born was 30.8% and last born was 29.6% which was comparatively low to first born and middle born. Middle age was high, all of them such as 39.6%. The next detail is the hospitalization for any medical reason the frequency and percentage had only slight differences and reason for hospitalization were also collected with the consent form. From the data analyzed female population was higher when compared to male population and all the samples are from Coimbatore, Sullur. The percentage of middle born is higher than other which indicates that most of the participants are second born. The birth order may also have a significant impact on coping styles. The consent of hospitalization was collected in order to gather information regarding brain injury or brain damage. As brain injury or damage has an impact on cognitive reserve where the damage in nerve cells can lead to brain dysfunctions where some may lose some functions. to avoid further discrepancies a consent regarding the reason for hospitalization were collected and the participants were also asked to specify the reason. Samples who were not interested to share are excluded from the study. Hospitalization may also have an impact on coping styles. The data here highlights that people who are hospitalized were not due to brain injury or brain damage.

**Table 4.2 Shows the Pearson correlation for the variables cognitive reserve dimensions and coping styles**

	CRI leisure	Education	Working
Pearson correlations	.139	1	.271**
Sig. (2-tailed)	.190		.009
N	91	91	91
	Coping		
Pearson correlation	.075	.080	.187
Sig (2- tailed)	.481	.456	.078
N	90	90	90

In accordance with table 4.2 there is a slight correlation between working and coping styles among older adults. The correlation is significant at the 0.01 level where there is correlation between working and coping styles. a study where the contribution of occupation and leisure time activities in coping strategies where occupation has slight significant value with coping strategies.(Juliana,2018). In this study they also stated that women were more vulnerable than men in emotional focused coping styles. Occupation might be a stimulating factor to think in an alternative way, where generally older adults might use some of it to cope with daily life stressors such as loneliness, depression. In a study self-distraction was the most common coping mechanism in depressed people and also quoted that people who felt loneliness were also assessed with depression (Nitin,2014). Occupational attainment is also a major contributing factor in cognitive reserve in a study lifetime experiences were assessed where occupation has greater significant in life time assessment which was assessed by cognitive reserve questionnaire (Jonana nogueira,2022) these are some of the major aspect about occupation and other than this leisure time activity and education also plays a role in cognitive reserve. A direct effect was observed on cognitive reserve with education, intelligence and leisure time activities (Carlina,2024)

**Table 4.3 represents the Kolmogrov Smirnov test for normality for the variables cognitive reserve and coping styles**

	Kolmogrov Smirnov	df	statistic	sig
Cognitive reserve		90	.959	.006
Coping styles		90	.928	.000

This table 4.3 shows the normality test for both the variables cognitive reserve and coping styles. The tables show that the data was normally distributed and with these values the Parametric test was administered.



**Table 4.4 shows the independent sample t test for the effect size in gender for the variables cognitive reserve and coping styles**

Variables	Group	N	Mean Rank	t	f	Sig
Cognitive reserve	Male	37	109.38	2.087	0.01	0.40
	Female	54	100.85	2.093		0.39
Coping	Male	37	35.50	.531	.189	.529
	Female	54	36.35	.525		.534

In table 4.4 the independent sample t test was depicted where there was a difference between male and female in both the variables cognitive reserve and coping. There is minimal difference between both the genders this might be due to unequal amount data where the female population is higher than male. This difference in both the variables such as coping style and cognitive reserve among gender has very minimal difference this indicates that both the gender might have no effect of cognitive reserve on coping. In a study of occupation, leisure time activities and coping styles the results found that women are more vulnerable to emotional support coping strategies. The study also states that other coping strategies such as expressing negative feelings show that when negative feelings are expressed need for seeking emotional or instrumental support.(Juliana,2018). Results indicate that there is minimal difference between the gender on the variables.

**Table 4.5 Shows the Pearson correlation for the variables cognitive reserve and coping styles**

	Total CRI	Total Coping
Pearson correlations	1	.181
Sig. (2-tailed)		.087
N	91	90

According to table 4.5 this depicts the correlation between cognitive reserve and coping styles among older adults. In the study the  $p$  – value is greater than the significant value that is 0.05 which indicates that there is no correlation between cognitive reserve and coping styles. This states there is a significant relationship between cognitive reserve and coping styles among older adults. This might be because of the external factors that contribute to aging like stress, quality of life(Samantha,2022) and satisfaction of life. As the study only focused on coping and cognitive reserve there is no significant correlation between these two variables. This plays as a limitation where other factors such as quality of life might play a major role in the older adults and this might be due to aging and physical complications. The study also quotes that there is no association between disease burden with cognitive reserve (Samantha, 2022). Stress might also be an important factor that needs to be analyzed in elderly people as the stress might be due to aging factors such as lack of hobbies and chronic health problems are strong predictors of loneliness which is another important factor for aging people( Hulya Arslantas,2015). One more effective factor such as spirituality and religious practice also plays a major role in elderly people. In a study it was said that religious practice independently related to depression among older adults hence the study concludes that spirituality and religious coping is a better way to improve depression among elderly people(Hayden & Kwang, 2003) As the study doesn't contribute to any other factors that might be a reason for no correlation

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