

**Hindi Vidya Prachar Samiti's**

**RAMNIRANJAN JHUNJHUNWALA COLLEGE**

**OF ARTS, SCIENCE & COMMERCE**

**(EMPOWERED AUTONOMOUS)**

**“Aging with Dignity : Supporting senior  
citizens in modern India”**

A project report submitted to the Department of Statistics of Ramniranjan Jhunjhunwala College of Arts, Science & Commerce (Empowered Autonomous)

**IN THE PARTIAL FULFILLMENT OF DEGREE OF MASTER  
OF SCIENCE IN STATISTICS**  
**BY**

<b>Tanvi Avasare</b>	<b>- 901</b>
<b>Ajay Gaud</b>	<b>- 904</b>
<b>Jesteena Thomas</b>	<b>- 905</b>
<b>Mounika Kashi</b>	<b>- 929</b>
<b>Anshu Shah</b>	<b>- 945</b>
<b>Rahul Prajapati</b>	<b>- 946</b>
<b>Sejal Kadu</b>	<b>- 948</b>



# Ramniranjan Jhunjhunwala College of Arts, Science and Commerce

## Department of Statistics

### CERTIFICATE

This is to certify that the project “Aging with Dignity : Supporting senior citizens in modern India” was carried out by a group of seven students during the academic year 2024-2025.

The team comprised of:

<b>Tanvi Avasare</b>	- 901
<b>Ajay Gaud</b>	- 904
<b>Jesteena Thomas</b>	- 905
<b>Mounika Kashi</b>	- 929
<b>Anshu Shah</b>	- 945
<b>Rahul Prajapati</b>	- 946
<b>Sejal Kadu</b>	- 948

This work is best of our knowledge and belief.

Date: 13/01/2025

**Prof-In-Charge**

(Prof. Jaishankar Singh)

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# INTRODUCTION

Growing old is an inevitable part of life, bringing with it the wisdom of experience and the challenges of transition. In the Indian context, elderly citizens have traditionally been accorded a highly respected position in families, where they were serving as sources of guidance and decision-making authority. The joint family system, deeply rooted in Indian tradition and supported by the Mitakshara School of Hindu Law, placed a moral obligation on children to care for their parents, with cultural ethos like “Pitru Devo Bhava” and “Mata, Pita, Guru, Dayvam” reinforcing this reverence.

However, the fabric of Indian society has changed significantly in recent years. The rise of nuclear families, urban migration, and dual-income households has led to a decline in the traditional role of elders. Today, many senior citizens face challenges such as neglect, loneliness, and financial insecurity, and their contributions to family decision-making are often undervalued. While some elders struggle with the emotional void of living apart from their children, others are compelled by economic necessity to work during their later years. Despite these changes, the cultural stigma attached to institutional settings maintains familial obligations in the majority of homes.

The older population's quality of life revolves around respect, autonomy and self-satisfaction. Research indicates that respect and participation in decision-making processes significantly influence their self-esteem and mental well-being. These aspects of respect and power in decision-making processes are crucial to increasing self-esteem and psychological self-esteem. Health care support, financial security, and their participation in social activities make them live a happy and fulfilled life. Government programs, like pensions, healthcare programs, and the National Policy for Older Persons (1999), try to address these problems, but their effectiveness often depends on awareness, accessibility, and proper implementation.

## **This research seeks to explore:**

1. The evolving role of elders in family decision-making processes amidst societal changes.
2. The factors influencing respect, self-esteem, and quality of life among senior citizens, with a focus on dignity.
3. The effectiveness of government schemes in addressing financial, health, and social dimensions of aging populations.

As India faces a growing aging population, expected to surpass 300 million by 2050, this study emphasizes the importance of integrating traditional values with modern solutions. By analyzing these intersections through statistical methods, This study intends to provide actionable insight through statistical methods in an effort to help policymakers, families, and communities create a society that accepts aging not as it endures but as it respects with dignity and purpose.

# **OBJECTIVES**

1. To observe the impact of Socio-demographic factors on Dignity of the elders.

Socio-demographic factors:

- Age
- Gender
- Marital Status
- Current living arrangement
- Highest level of education attained by family members

2. To analyze factors affecting the dignity of senior citizens.

3. To study the impact of government schemes on senior citizens.

4. To develop a Multiple Linear Regression model to predict the dignity score based on factors influencing dignity.

# RESEARCH METHODOLOGY

## **Survey Method:**

This study adopts a survey-based approach utilizing a **Cross-Sectional Study design** to explore the experiences, challenges, and aspirations of senior citizens in modern India regarding aging with dignity.

### **1. Target Population**

The target population for this study includes senior citizens aged 60 years and above, residing in urban and rural areas across India. The focus is on capturing diverse perspectives, encompassing various socio-economic, cultural, and regional backgrounds to provide a comprehensive understanding of aging in the Indian context.

### **2. Data Collection**

#### **Pilot Survey:**

- Before initiating the full-scale data collection, a **pilot survey** was conducted to test the effectiveness and clarity of the questionnaire.
- A small sample of senior citizens participated in the pilot survey, providing valuable feedback on the content, structure, and language of the questions.
- Based on their input, the following flaws were identified and rectified:
  - **Ambiguity in questions:** Certain questions were rephrased for clarity.
  - **Length of the questionnaire:** Some redundant questions were removed to reduce respondent fatigue.
  - **Ease of response:** Options for multiple-choice questions were revised to be more inclusive and understandable.

#### **Questionnaire:**

- A structured questionnaire has been designed to collect quantitative and qualitative data from respondents.
- The questionnaire is distributed via **Google Forms**, ensuring easy accessibility for individuals with internet access. Family members are encouraged to assist senior citizens in completing the form, where necessary.

#### **Scheduled Interviews:**

- For individuals without access to digital tools or who may face challenges in completing the form independently, scheduled face-to-face interviews are conducted.
- Trained researchers administer the same set of questions to maintain uniformity in data collection.

### **Collected Responses:**

A total of 130 Responses were collected for the study

### **3. Rationale for Cross-Sectional Design**

This design allows the collection of data at a single point in time from a large sample, facilitating the analysis of patterns, trends, and relationships among variables such as socio-economic status, health conditions, and access to support systems.

### **4. Sampling Method**

The study employs a combination of purposive and snowball sampling techniques to identify and reach the elderly population effectively. Initial participants are identified through local community networks, and they are encouraged to refer to other eligible individuals.

### **5. Data Cleaning Method**

Data cleaning is a critical step in ensuring the accuracy and reliability of the collected data. For this study on aging with dignity, data cleaning is performed using **Microsoft Excel** due to its robust data management and analysis features. The following steps outline the data cleaning process:

#### **a) Removal of Duplicate Entries**

- Duplicate responses, identified by matching unique identifiers such as email addresses (if applicable) or timestamps, are removed to ensure each individual is represented only once in the dataset.

#### **b) Handling Missing Data**

- Responses with incomplete or missing key variables are flagged.
- For essential fields, records with missing data are excluded if the information cannot be retrieved.
- Non-critical missing data is handled using imputation techniques or marked as “Not Provided” for transparency.

#### **c) Validation of Responses**

- Outliers are identified and reviewed, ensuring they reflect genuine responses rather than data entry errors.

**e) Removal of Ineligible Respondents**

- Responses from individuals outside the target population (e.g., under the age of 60 or incomplete forms completed by younger family members) are filtered out.

**f) Categorization and Coding**

- Responses are coded numerically for statistical analysis to simplify data processing.

**g) Verification and Cross-Checking**

- The cleaned dataset is cross-verified with raw data to ensure no critical information is lost during the cleaning process.
- A subset of data is manually reviewed to confirm the accuracy of automated cleaning processes.

By employing Excel's filtering, conditional formatting, and formula-based tools, this systematic approach ensures the dataset is accurate, complete, and ready for further analysis. This step enhances the validity of insights derived from the study and contributes to its overall reliability.

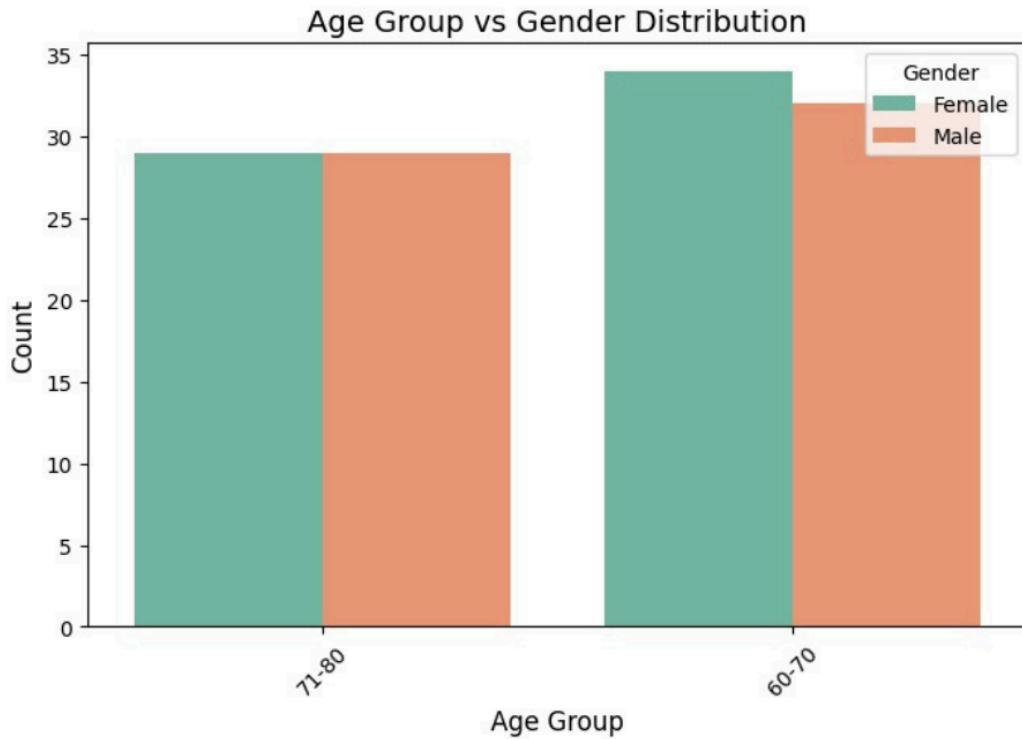
After data cleaning 124 respondent's data was used for further analysis.

## 6. Ethical Considerations

- Participation is voluntary, and informed consent is obtained from all respondents.
- Confidentiality of personal information is maintained throughout the research process.

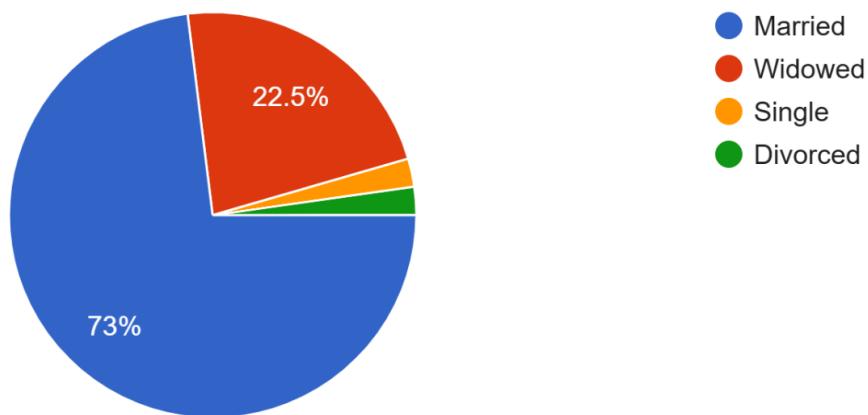
# EXPLORATORY DATA ANALYSIS (EDA)

## Age & Gender Distribution:



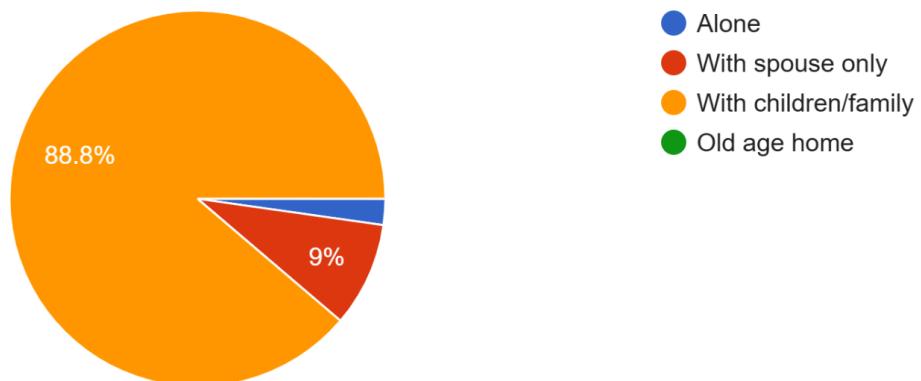
- 60-70 Age group respondent's consist of more female than male
- 71-80 Age group respondent's consist equal number of male and female

## Marital Status:



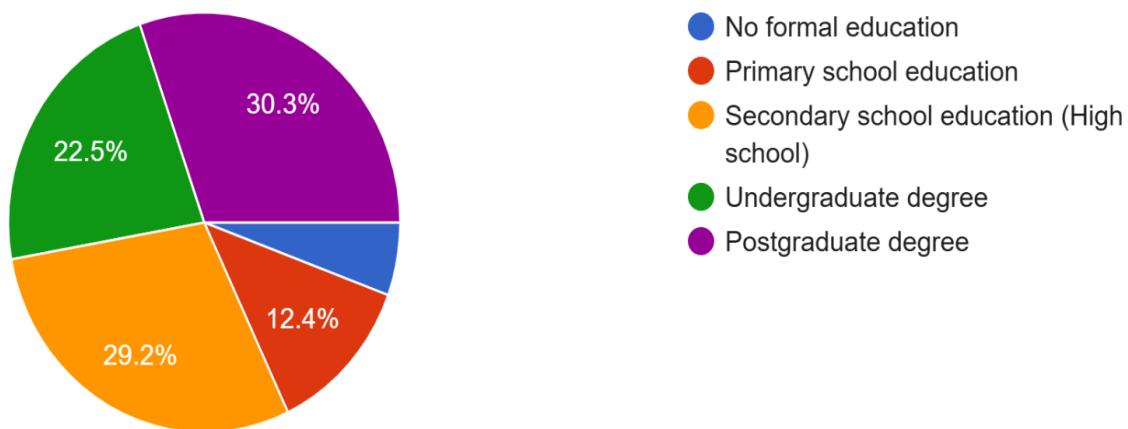
- 73 % of the respondents are married
- 22.5 % of respondents are widowed.

## **Living Arrangement:**



- Majority of the respondents are living with their children/family

## **Highest Qualification attained by family members:**



- The highest qualification attained by the majority of respondent's family members is Post Graduate followed by Secondary school education and Undergraduate degree.

# **ANALYSIS & MODEL**

## **Correlation Analysis:**

### **- Spearman's Rank Correlation Coefficient**

Spearman's rank correlation measures the strength and direction of association between two ranked variables. It basically gives the measure of monotonicity of the relation between two variables i.e. how well the relationship between two variables could be represented using a monotonic function.

- To check whether there is any relationship between **family support** and **difficulties in availing government benefits**.

Formula:

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

$\rho$  = Spearman's rank correlation coefficient  
 $d_i$  = difference between the two ranks of each observation  
 $n$  = number of observations

**Spearman's rank correlation coefficient : 0.01545**

**P-value :0.88707**

**Conclusion:** The correlation between the two variables is very weak, and the relationship is not statistically significant.

- To evaluate the relationship between satisfaction with government programmes and stress management confidence

**Spearman's rank correlation coefficient : 0.045397**

**P-value :0.616610**

**Conclusion:** The correlation between the two variables is very weak, and the relationship is not statistically significant.

## Non-parametric Analysis:

### - Mann-Whitney U test

The Mann-Whitney U test assesses whether two sampled groups are likely to derive from the same population and essentially asks; do these two populations have the same shape with regards to their data? In other words, we want evidence as to whether the data drawn from populations with different levels of a variable of interest

- To check if there is a significant difference in **perceived support from family between males and females.**

Formula:

$$U_1 = n_1 n_2 + \frac{n_1(n_1+1)}{2} - R_1, U_2 = n_1 n_2 + \frac{n_2(n_2+1)}{2} - R_2$$

Where,

n1 = size of the first group

n2 = size of the second group

R1 = sum of the ranks of the first group

R2 = sum of the ranks of the second group

**W = 1898.5, p-value = 0.9021**

**Conclusion :** Since the p-value is large (0.9021), it suggests that there is no significant difference between males and females in terms of their perceived support from family. Therefore, we fail to reject the null hypothesis and conclude that, based on this test, there is no significant difference in perceived support between the two genders.

## - Kruskal-Wallis test

The Kruskal-Wallis test (H test) is a non-parametric statistical test used to compare three or more independent groups to determine if there are statistically significant differences between them. It is an extension of the Mann-Whitney U test, which is used for comparing two groups.

- To check if the age group affects satisfaction with financial support from family.

Formula:

$$H = \frac{12}{N(N+1)} \sum_{i=1}^k \frac{R_i^2}{n_i} - 3(N+1)$$

Where,

N = Total no. of observation across all group

k = Number of groups

R<sub>i</sub> = Sum of ranks of group i

n<sub>i</sub> = Number of observations in group i

**Test Statistic: 1.87**

**P-value: 0.17**

**Conclusion:** Since the p-value (0.17) is greater than the common significance level of 0.05. This means that there is no significant difference in financial satisfaction across the different age groups.

- **Bartlett's Test of Sphericity**

This test checks whether the correlation matrix is an identity matrix, which would indicate no relationships between variables and make factor analysis inappropriate.

**H<sub>0</sub>:** correlation matrix is an identity matrix.

**v/s**

**H<sub>1</sub>:** correlation matrix is not an identity matrix.

**P-value:** < 0.001

**Conclusion:** since p-value is less than 0.05, we reject the null hypothesis and conclude that the correlation matrix is not an identity matrix, indicating sufficient correlation between variables.

- **Kaiser-Meyer-Olkin (KMO) Test:**

This test measures sampling adequacy to determine whether the dataset is suitable for factor analysis. The KMO statistic ranges from 0 to 1, where values closer to 1 indicate higher adequacy.

**H<sub>0</sub>:** The sample data is not adequate for factor analysis.

v/s

**H<sub>1</sub>:** The sample data is adequate for factor analysis.

**KMO value: 0.746**

**Conclusion:** KMO value was 0.746, which is greater than the threshold of 0.5. Thus, we reject the null hypothesis and conclude that the sample data is adequate for factor analysis.

## **Factor Analysis:**

### Factor Analysis in the Study on Aging with Dignity

In this study on aging with dignity, the primary objective was to understand how various factors contribute to maintaining dignity among older adults. Given the complexity of the dataset, which included 15 independent variables, it was essential to simplify and organize the data into a more manageable and meaningful structure. This was achieved through the use of factor analysis, a statistical technique designed to reduce a large number of variables into a smaller set of latent factors that represent the underlying relationships within the data.

The dependent variable for this study was the Dignity Score, a measure capturing the extent to which individuals perceive their dignity is upheld. The 15 independent variables were hypothesized to influence this score. However, analyzing all 15 variables simultaneously in their raw form would make interpretation cumbersome and could lead to issues like multicollinearity in subsequent multiple linear regression (MLR) analysis.

To ensure the effectiveness of factor analysis, preliminary tests were conducted to determine the suitability of the data. The tests include:

1. Bartlett's Test of Sphericity
2. Kaiser-Meyer-Olkin (KMO) Test.

Both tests indicate that the data is appropriate for factor analysis.

The original set of 15 independent variables, listed below, was reduced to a smaller set of factors to enhance interpretability:

1. Value\_of\_Opinion
2. Acknowledgement\_of\_Achievement
3. Feeling\_disrespected
4. Importance\_preserving\_dignity
5. Dignity\_maintained\_even\_if\_dependent
6. Spending\_time\_with\_elders
7. Steps\_maintain\_health
8. Current\_health\_condition\_and\_activities
9. Health\_neglected\_overlooked
10. Sufficient\_savings

11. Financial\_support(from\_family)
12. Financial\_situation\_makes\_dependent
13. Connected\_to\_family\_friends
14. Confidence\_in\_managing\_stress
15. Isolated\_from\_social\_activities

By reducing the dimensionality of the data through factor analysis, the study achieves better interpretability and improves the efficiency of subsequent statistical analyses, such as multiple linear regression.

## **Principal Component Analysis (PCA):**

To further simplify and structure the data, Principal Component Analysis (PCA) was conducted. PCA is a statistical technique used to reduce the dimensionality of a dataset while retaining as much variance as possible. In this analysis, PCA was applied to the 15 independent variables, and the results are summarized in the table titled "Total Variance Explained."

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.036	26.907	26.907	4.036	26.907	26.907	2.170	14.468	14.468
2	1.642	10.949	37.855	1.642	10.949	37.855	1.940	12.934	27.402
3	1.400	9.333	47.188	1.400	9.333	47.188	1.808	12.051	39.453
4	1.184	7.895	55.083	1.184	7.895	55.083	1.796	11.973	51.427
5	1.082	7.212	62.295	1.082	7.212	62.295	1.630	10.868	62.295
6	.892	5.946	68.241						
7	.842	5.613	73.853						
8	.774	5.159	79.013						
9	.609	4.061	83.074						
10	.554	3.692	86.765						
11	.519	3.460	90.225						
12	.409	2.725	92.950						
13	.392	2.614	95.564						
14	.340	2.265	97.829						
15	.326	2.171	100.000						

Extraction Method: Principal Component Analysis.

## **Explanation of the Table:**

### **Components:**

These represent the new variables (principal components) derived from the original dataset. Each component is a linear combination of the original variables, arranged in descending order of their ability to explain the variance in the data.

### **Initial Eigenvalues - Total and % of Variance:**

- The "Total" column shows the eigenvalues for each component, which indicate how much variance a component explains.
- The "% of Variance" column provides the percentage of the total variance in the data explained by each component individually.

#### Cumulative %:

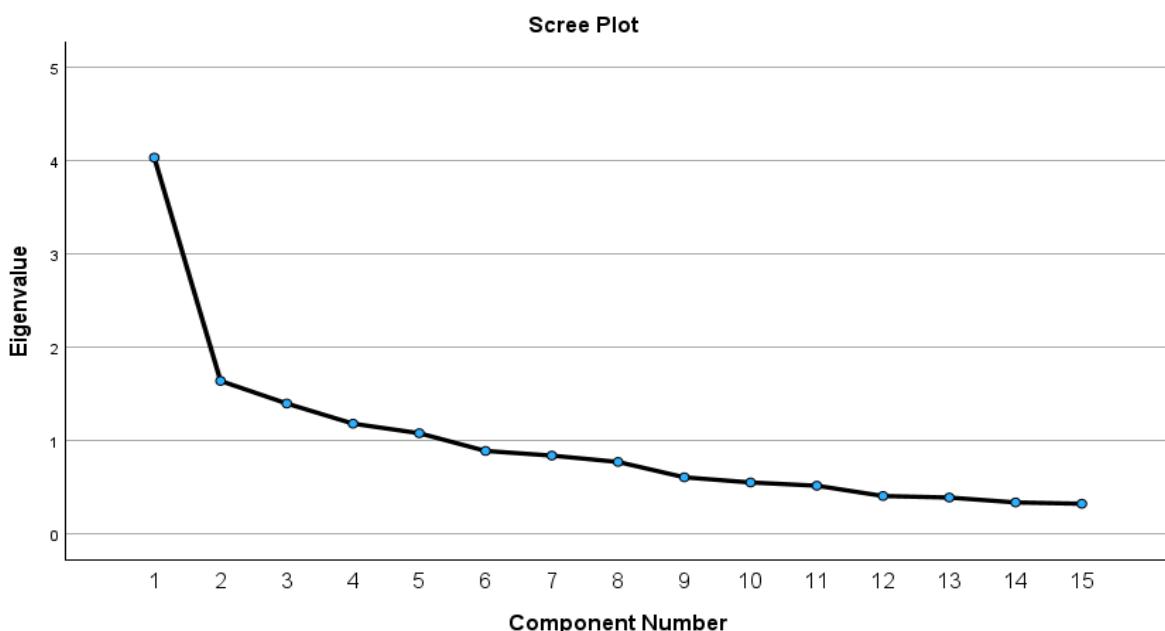
This column displays the running total of the variance explained by all components up to that point. For example, the first three components explain a cumulative 47.19% of the variance in the data.

#### Extraction Sums of Squared Loadings:

After extracting significant components (based on the criteria used), this section shows the eigenvalues and variance explained by those retained components. In this case, five components were retained.

- Using the **Kaiser Criterion**, components with eigenvalues greater than 1 were selected, resulting in five principal components being retained.
- These five components collectively explain **62.29% of the total variance** in the dataset, meaning they capture the majority of the variability in the data while reducing its complexity.

By reducing the dataset to these five factors, the analysis becomes more focused and manageable, providing a clearer understanding of the underlying patterns in the data.



The scree plot shows the eigenvalues for 15 components, with the eigenvalues plotted against their corresponding component numbers.

### **X-Axis (Component Number):**

- Represents the components or factors, ordered sequentially.
- Each component corresponds to a possible dimension of the data.

### **Y-Axis (Eigenvalue):**

- Represents the amount of variance explained by each component.
- Higher eigenvalues indicate components that explain more variance.

### **Criterion for Component Extraction:**

- A commonly used rule in PCA is the **Kaiser Criterion**, which suggests retaining components with eigenvalues greater than 1.
- Components with eigenvalues  $>1$  are considered significant as they explain more variance than a single variable.

### **Observations:**

- In this plot, the eigenvalues for the first five components are greater than 1.
- After the fifth component, the eigenvalues drop below 1, indicating that additional components contribute less variance than an individual variable.

### **Conclusion:**

- Based on the eigenvalue  $>1$  rule, **5 components** are extracted for further analysis.
- These 5 components collectively capture the most meaningful variance in the dataset.

### **Implications:**

- By reducing the dimensionality to 5 components, the analysis retains the core information while simplifying the dataset.
- The selected components can now be analyzed further to understand their contribution to explaining the variance in the data.

## **Factor Extraction:**

No	Variable	Rotated Component Matrix <sup>a</sup>				
		1	2	3	4	5
1	Value_of_Opinion			0.583		
2	Acknowlegement_of_Achievement			0.499		
3	Feeling_disrespected			0.780		
4	Importance_preserving_dignity	0.701				
5	Dignity_maintained_even_if_dependent	0.784				
6	Spending_time_with_elders				0.674	
7	steps_maintain_health				0.495	
8	Current_health_condition_and_activities				0.783	
9	Health_neglected_overlooked					0.674
10	Sufficient_savings	0.778				
11	Financial_support(from_family)	0.643				
12	Financial_situation_makes_dependent				0.847	
13	connected_to_family_friends					0.489
14	Confidence_in_managing_stress	0.403				
15	Isolated_from_social_activities					0.547

This table presents the **Rotated Component Matrix**, derived from a factor analysis performed using the **Equamax rotation method**. Equamax is a hybrid rotation technique that combines features of Varimax and Quartimax rotations, aiming to achieve simpler factor structures by maximizing the variance of squared loadings both within and across factors. The rotation enhances interpretability by aligning variables more clearly with distinct components (factors).

The table shows the variables (questions or items) and their loadings on five factors. Factor loadings indicate the degree of correlation between each variable and a specific factor. Highlighted values represent significant loadings (typically above 0.4 or 0.5), suggesting which variables strongly contribute to each factor.

Based on the analysis and the rotated matrix, the following **five factors** were identified:

## 1. Family Inclusion

### • Key Variables:

- "Value of Opinion"
- "Acknowledgement of Achievement"
- "Connected to Family/Friends"

This factor represents the role of familial relationships, recognition, and inclusion in maintaining an individual's sense of belonging. The variables indicate the importance of family support and acknowledgment in fostering emotional well-being.

## 2. Financial Security

### • Key Variables:

- "Sufficient Savings"
- "Financial Support (from family)"
- "Financial Situation Makes Dependent"

This factor captures the financial aspects of an individual's life, including self-sufficiency, dependence on family for financial support, and the perceived adequacy of personal savings. Financial security emerges as a key domain impacting quality of life

## 3. Respect

- **Key Variables:**
  - "Feeling Disrespected"
  - "Importance of Preserving Dignity"
  - "Dignity Maintained Even if Dependent"

This factor highlights the importance of dignity and respect, especially in social and familial contexts. It reflects individuals' concerns about being valued and maintaining self-respect even in situations of dependency.

#### **4. Health & Well-being**

- **Key Variables:**
  - "Steps to Maintain Health"
  - "Current Health Condition and Activities"
  - "Health Neglected/Overlooked"

This factor relates to health management and awareness, emphasizing the importance of maintaining good health and recognizing health-related concerns. It reflects individuals' efforts and challenges in ensuring their physical well-being.

#### **5. Social Engagement**

- **Key Variables:**
  - "Spending Time with Elders"
  - "Isolated from Social Activities"
  - "Confidence in Managing Stress"

This factor focuses on social interaction and emotional resilience. It highlights the importance of social connections, participation in activities, and the ability to handle stress effectively as key determinants of social engagement.

The **Equamax rotation** method was applied to simplify the data and enhance clarity by balancing simplicity within factors (grouping variables strongly linked to a single factor) and across factors (distributing variables distinctly among factors). This approach ensured that the five factors emerged as distinct yet meaningful domains, aligning with the conceptual framework of family dynamics, financial stability, personal respect, health, and social interaction.

Now , after extracting this 5 Factor this will help for further analysis to fit multiple regression model. 5 factor will assume as a independent variable for further analysis

## **Multiple Linear Regression:**

Multiple linear regression (MLR) is a statistical technique that uses multiple independent variables to predict the outcome of a dependent variable. It's a type of regression model that uses a straight line to estimate the relationship between the variables.

- **Assumptions:**

**Linearity:** The line of best fit is a straight line, not a curve.

**Homoscedasticity:** The variance of the errors is the same across all levels of the independent variable.

**Normality:** The data follows a normal distribution

**Autocorrelation:** The error terms (residuals) should not be correlated with each other.

**Multicollinearity:** No multicollinearity exists between variables.

All the assumptions were checked during MLR fitting.

## **Predicting Dignity Score:**

- **Dependent variable:** Dignity score
- **Independent variable:** Respect, Family Inclusion, Health & Well-being, Financial Security, Social Engagement.
- Since the sample size was low bootstrapping was applied to the data.

### **Model:**

<b>Model</b>	<b>Factors</b>	<b>Coefficients</b>	<b>Std. Error</b>	<b>Contribution (in %)</b>
1	Constant	40.395	0.104	
	Family Inclusion	3.136	0.125	37.45
	Financial Security	3.327	0.104	39.74
	Respect	0.031	0.112	0.37
	Health & Well-being	1.568	0.100	18.73
	Social Engagement	0.311	0.87	3.71

### **Model Summary:**

<b>Model</b>	<b>R</b>	<b>R square</b>	<b>Adjusted R Square</b>	<b>Std. Error</b>
1	0.973	0.948	0.945	1.163

## **Result:**

- 94.8 % of the total variance in the data is explained by the model.
- The model is overfitted.

## **CONCLUSION**

- Average dignity score for the sample data is 40.39.
- Gender does not influence the perceived support from family.
- Financial support received from family is independent of age.
- Government Program has no impact on how confident elders feel about managing stress.

## **DISCUSSION**

The study on "Aging with Dignity" has provided significant insights into the multifaceted aspects of aging and the importance of maintaining dignity throughout the aging process. The findings underscore that dignity in aging is influenced by a combination of personal, social, and environmental factors.

The study also revealed that access to quality healthcare and age-friendly environments significantly impact the dignity of aging individuals. Participants indicated that respectful and empathetic healthcare services contribute to their overall dignity. Moreover, environments that accommodate the physical and cognitive changes associated with aging can empower older adults to maintain independence and dignity.

Additionally, financial security was identified as a determinant of dignity in aging. Economic stability allows older adults to access necessary resources and services, thereby reducing stress and enhancing quality of life. Policies aimed at ensuring financial protection for the elderly could significantly bolster their sense of dignity.

During the study, a major challenge encountered was data collection, which led to results that did not fully meet the desired outcomes. This limitation suggests that future studies should consider employing a larger sample size to improve the reliability and generalizability of the findings.

Future research should explore the experiences of diverse aging populations, considering factors such as gender, ethnicity, and socioeconomic status, to develop more comprehensive strategies for supporting dignity in aging. Longitudinal studies could also provide deeper insights into how dignity evolves throughout the aging process.

In conclusion, aging with dignity is a multidimensional concept that requires a holistic approach involving individual autonomy, social support, quality healthcare, positive societal attitudes, and financial security. Addressing these interconnected factors can significantly enhance the dignity and overall well-being of older adults.

# QUESTIONNAIRE

The questionnaire employed in this study is a modified version of the **Jacelon Attributed Dignity Scale (JADS)**, specifically tailored to assess the perceived dignity of senior citizens in modern India. The original JADS is a validated instrument designed to measure self-perceived attributed dignity among older adults.

## Key Principles Incorporated:

- **Respect:** Items evaluate the degree to which individuals feel respected by others and perceive themselves as worthy of respect.
- **Financial Security:** Questions assess perceptions of financial stability and its impact on personal dignity.
- **Healthcare Access:** Items explore satisfaction with access to healthcare services and its influence on maintaining dignity.
- **Autonomy and Independence:** Questions gauge the extent to which individuals feel autonomous and in control of their lives.

## Modifications Made:

To ensure cultural relevance and comprehensiveness, the original JADS was adapted as follows:

- **Cultural Adaptation:** Items were rephrased to reflect the socio-cultural context of India, ensuring clarity and relatability for Indian senior citizens.
- **Additional Domains:** New items were introduced to cover aspects such as family support and social participation, which are pertinent to the Indian setting.

## Reverse Scoring Implementation:

To mitigate response biases and enhance the reliability of the questionnaire, reverse scoring was applied to certain items. This technique involves phrasing some questions negatively and reversing the scoring scale for these items during analysis. For example, in a 5-point Likert scale, a response of 'Strongly Disagree' (scored as 1) on a negatively worded item would be converted to a score of 5. This approach ensures that higher total scores consistently represent higher levels of perceived dignity.

## Structure of the Questionnaire:

- **Format:** The questionnaire comprises a series of statements rated on a Likert scale, ranging from 'Strongly Disagree' to 'Strongly Agree.'
- **Administration:** It is designed for self-administration via Google Forms, with provisions for assistance by family members or researchers if needed.

By integrating the foundational principles of the JADS and incorporating culturally relevant modifications, this questionnaire serves as a robust tool for assessing the dignity of senior citizens in modern India.

**The following is the link for questionnaire which is used for study:**

<https://forms.gle/YPusNEQ74YtRkybC7>

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