

## **Subjective life expectancy and associated correlates among older adults in community-dwelling of Uttar Pradesh, India.**

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### **Introduction**

Subjective life expectancy (SLE) or perceived life expectancy is defined as the self-esteemed perception about their remaining life and represents an essential and relevant predictor of individual well being. As noted by Ross and Mirowsky (2002), “the expectation of life is the expectation of having that which makes all other gratifications possible.” Without this expectation, an individual cannot desire other possibilities for his or her life.

Expecting to live long may signify vibrancy and represent physical and emotional wellness, whereas expecting to die early may reflect a higher sense of hopelessness, which may diminish well-being (Baum & Boxley, 1983). SLE is a measure that quantifies the perceived extent of one’s remaining years, providing a customize timeframe that can act as a guide for apportioning work, leisure, and finances (Hesketh, Griffin, & Loh, 2011). Early research on SLE demonstrates that people do have an opinion as to their likely life expectancy, with more recent evidence suggesting that SLE influences behavioral intentions and decision making. For a long time, economic analysis of choice data has been based on the assumption that the decision makers have a rational expectation, which also based on an assumption concerning survival probability. Information provided by life table is limited, especially because they give a little information about interindividual heterogeneity in life expectancy. The above-given life expectancy (Life expectancy at birth) information by gender and age only, while personal health, parental longevity and lifestyle factor.

Subjective life expectancy (SLE) relevant to critical economic decisions of the household such as consumption versus saving behavior, choice of retirement age, fertility decision and investment in child welfare and education. Again the risky health behaviors such as smoking and drug use are influenced by SLE because people may continue/stop such behaviors if they underestimate/overestimate reductions in their life-expectancy resulting from these behaviors. Subjective life expectancy (SLE) is closely related to the well-being of the individual (Kaufman & Elder, 2002; Mirowsky & Ross, 2000; Reid & MacLulich, 2006).

There is a growing body of research interest in subjective measures of health and survival. People expect their remaining length of life, and these expectations appear to make sense as it influences health and health-seeking behavior (Sarkisian et.al., 2002). Subjective or self-rated- life expectancy shows systematic variation across individuals by known risk factors,

such as poor health conditions or diagnosed diseases and socioeconomic circumstances (Mirowsky & Ross, 2000). Subjective life expectancy has been studied in a broad range of human behavior, such as saving, consumption and health Behaviour (Ziegelmann, Lippke, & Schwarzer, 2006).

Many studies have done in the developed country and more focus on the economic aspect of human behavior, but still there is lack of academic research who can contribute to this phenomenon in the developing or low and middle-income country like India where the older adults (50+) population are growing and tend to be elderly in near future. So in this context, it is important to identify the determinants of Subjective life expectancy (SLE) and investigate their association with biomedical & generic, socioeconomic, health behavior and, related psychological factors.

### **Data:**

A cross-sectional survey has been done using multi-stage random sampling procedure that was conducted among older adult (50+ years) in Varanasi District of Uttar Pradesh, India. Varanasi is the eastern district of Uttar Pradesh and known as one of the oldest and holy cities in the Indian subcontinent. The survey was conducted during November 2017-March 2018, among 426 respondents with the response rate of 94%. The final 400 sample was used in the analysis. The survey instrument was tested before the final data collection. Data collection is done through face to face paper pensile interview with updated survey schedule. Written consent from individuals was taken before carried out the survey.

### **Methods:**

#### ***Outcome variable***

#### **Subjective life expectancy (SLE)**

SLE is assessed through a single question asked in the survey “To what age do you expect yourself will be live?” The response was given in single year as it is more straightforward and easily answerable question.

#### ***Predictors:***

Griffin, B. (2013) suggests four important factors are used for the analysis.

#### **Biomedical and generic factor**

Factor included in this category was gender (male=1; female=2), age (50-60=0, 61-70=1, 71-80=2, 80-105=3), self rated health (good health=0, poor health=1), total number of self rated

chronic disease or multimorbidity (no disease=0, any 1 disease=1,  $\geq 2$  disease=2). The specific question was asked to assess the multimorbidity was “Have you ever been diagnosed with/told you to have (disease included arthritis, angina, asthma, depression, chronic lung disease, stroke, hypertension, cataract and edentulism (loss of all natural teeth)).” For making multimorbidity, all chronic disease is added up and categorized according to above-given categories.

### **Socio-Economic factor**

Factor included in this category was place of residence (Rural=0, Urban=1), Year of education attain (No education=0, <5year=1, <10 year=2,  $\geq 10$  year=3), religion (Hindu=0, Muslim=1), Caste (Sc/St=0, Other backward class=1, Otherwise=2), marital status (currently not marries=0, currently marries=1), and wealth quintile (lower=0, middle=1, higher=2)

### **Healthy Behavioral factor**

Factor including in this category was, diet (insufficient diet =0, sufficient diet=1), currently Smoking behavior (never=0, ever/currently use=1), and alcohol consumption (never=0, ever/currently use=1).

### **Psychological factor**

Happiness index is calculated through four questions using seven-point Likert scales. Four questions added to get happiness index where a higher value represents happiness lever whereas lower value represents low happiness. Life satisfaction (global cognitive judgment of satisfaction with one’s life) were assess through a seven-point scale. These five questions were added to get the final life satisfaction index; where lower value represents lower life satisfaction same as higher value represent higher life satisfaction.

### **Statistical analysis**

Bivariate and multivariate analysis has been used to achieve the objective. Descriptive analysis is used for describing the background characteristics of the study population. Multivariate linear regression models were used to examine the association of different factors (like; Biomedical and generic factor, Socio-Economic factor, Healthy Behavioral factor, and Psychological factor) with subjective life expectancy. Four different models were used for a better understanding of associated factor with subjective life expectancy in the study population.

### **Results**

Descriptive statistics results of the sample population are presented in **Table 1**. A higher proportion (44.5 %) of the sample belongs to the 50-60 age groups with a lower sample (7.3 %)

from the 80+ age. Male and female share an equal proportion of the sample with 16.5% participant reported poor self-rated health, whereas around half of the sample did not report any anxiety symptom with an equal share of moderate and severe anxiety. 40% participant reported they have anyone chronic disease whereas more than one forth responded they have more than or equal to two chronic conditions. Two third of sample belonging to a rural area, currently married and having insufficient food with 56% sample is illiterate, and 85% sample belong to Hinduism religion. Mean happiness value was 14.8 with 19.3 value of life satisfaction.

Results of regression analysis of the association of different factors (like; Biomedical and generic factor, Socio-Economic factor, Healthy Behavioral factor, and Psychological factor) with subjective life expectancy in **Table 2**. In a fully adjusted model age, self-rated poor health, severe anxiety symptom, having the disease (at least 1 and  $\geq 2$  disease), the residence of the urban setting are inversely associated with subjective life expectancy; whereas a higher year of schooling, feeling of happiness and life satisfaction are positively associated with subjective life expectancy.

**Figure 1** represents the age-specific subjective life expectancy. It observed from the graph that with an increase in age, subjective life expectancy decline, whereas the higher subjective life expectancy was observed in the earlier age of older adults (50+). **Figure 2** represent that with higher life satisfaction and happiness, higher subjective life expectancy observed.

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**Table 1: Sample characteristics of the study population**

	Frequency	Percentage
<b>Biomedical &amp; Generic factor</b>		
<b>Age</b>		
50-60	178	44.5
61-70	127	31.8
71-80	66	16.5
80+	29	7.3
<b>Sex</b>		
Male	200	50.0
Female	200	50.0
<b>Self Rated Health</b>		
Good	83.5	83.5
Poor	66	16.5
<b>Anxiety</b>		
none	192	48.0
mild	94	23.5
moderate	56	14.0
severe	58	14.5
<b>No. of disease</b>		
No disease	130	32.5
1 disease	160	40.0
≥2 disease	110	27.5
<b>Socio-economic Factor</b>		
<b>Residence</b>		
Rural	252	63.0
Urban	148	37.0
<b>Education</b>		
No schooling	225	56.4
<5 years	52	13.0
<10 year	76	19.1
≥10 year	46	11.5
<b>Religion</b>		
Hindu	85.25	85.3
Muslim	59	14.8
<b>Caste</b>		
Sc/St	84	21.0
OBC	227	56.8
Otherwise	89	22.3
<b>Marital Status</b>		
Currently not married	130	32.5
Currently married	270	67.5
<b>Wealth Quintile</b>		
Low	134	33.5
Middle	133	33.25
High	133	33.25
<b>Health Behavior</b>		
<b>Diet</b>		
insufficient	261	65.3
sufficient	139	34.8
<b>Smoking</b>		
Never smoke	226	56.5
Ever/currently smoking	174	43.5
<b>Alcohol consumption</b>		
Never	329	82.3
Ever/currently	71	17.8
<b>Psychological Factor</b>		
Happiness*	14.87 (3.73)	
Life satisfaction*	19.315 (5.84)	

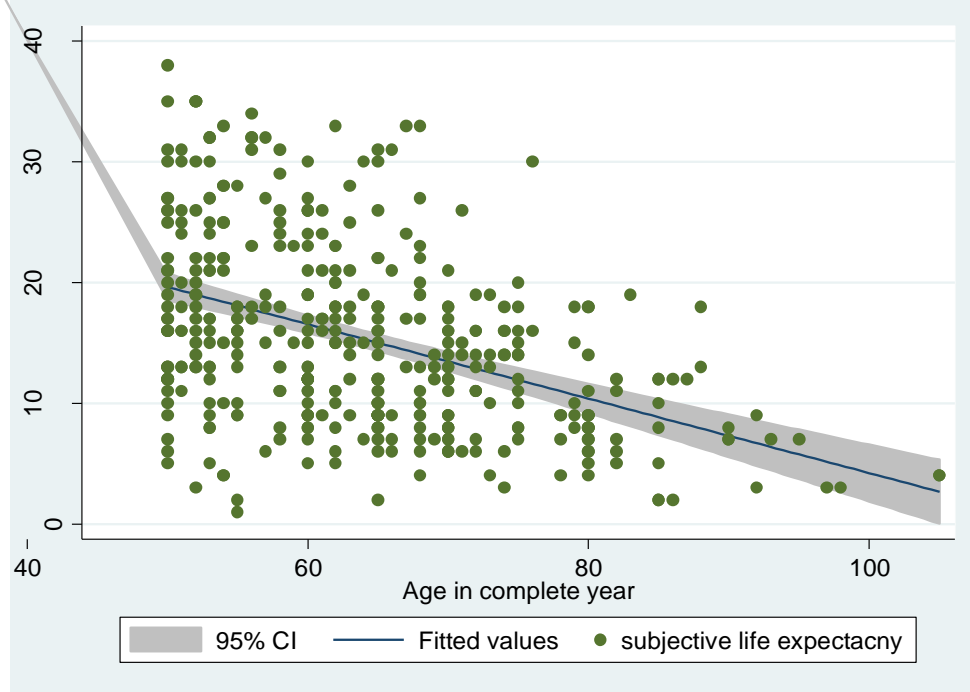
\*Mean (SD)

**Table 2. Association between subjective life expectancy and other background characteristics**

	Model 1	Model 2	Model 3	Model 4
<b>Biomedical &amp; Generic factor</b>				
<b>Age</b>				
50-60				
61-70	-3.55***[-5.01 : -2.09]	-3.51***[-4.93 : -2.1]	-3.6***[-5 : -2.2]	-3.83***[-5.17 : -2.49]
71-80	-6.43***[-8.24 : -4.62]	-5.98***[-7.69 : -4.27]	-6.1***[-7.78 : -4.41]	-5.75***[-7.37 : -4.14]
80+	-9.94***[-12.45 : -7.43]	-8.62***[-11.12 : -6.12]	-8.84***[-11.32 : -6.37]	-9.04***[-11.4 : -6.68]
<b>Sex</b>				
Male				
Female	-1.92**[-3.19 : -0.65]	-0.87[-2.18 : 0.43]	-0.68[-2.09 : 0.74]	-0.7 [-2.05 : 0.65]
<b>Self Rated Health</b>				
Good				
Poor	-2.92***[-4.64 : -1.21]	-3.15***[-4.75 : -1.55]	-3.15***[-4.74 : -1.56]	-2.54***[-4.07 : -1.01]
<b>Anxiety</b>				
none				
mild	-2.65***[-4.2 : -1.1]	-2.07**[-3.54 : -0.6]	-1.66*[-3.14 : -0.18]	-0.91 [-2.35 : 0.53]
moderate	-3.12**[-5.04 : -1.2]	-2.44**[-4.26 : -0.62]	-2.29*[-4.09 : -0.49]	-1.03 [-2.79 : 0.74]
severe	-6.68***[-8.59 : -4.77]	-4.57***[-6.41 : -2.74]	-4.38***[-6.2 : -2.56]	-2.48** [-4.32 : -0.64]
<b>No. of disease</b>				
No disease				
1 disease	-2.1**[-3.62 : -0.57]	-1.99**[-3.41 : -0.57]	-2.09**[-3.5 : -0.68]	-2.13** [-3.48 : -0.78]
≥2 disease	-3.39***[-5.12 : -1.66]	-3.92***[-5.53 : -2.31]	-4.15***[-5.76 : -2.55]	-4.17*** [-5.71 : -2.64]
<b>Socio-economic Factor</b>				
<b>Residence</b>				
Rural				
Urban		-4.37***[-5.64 : -3.1]	-4.12***[-5.39 : -2.85]	-4.2*** [-5.42 : -2.99]
<b>Education</b>				
No schooling				
<5 years		1.39[-0.39 : 3.17]	1.38[-0.38 : 3.14]	1.79* [0.13 : 3.47]
<10 year		1.5[-0.13 : 3.12]	1.19[-0.43 : 2.81]	1.06 [-0.51 : 2.62]
≥10 year		3.42**[1.21 : 5.62]	2.87*[0.67 : 5.07]	2.5* [0.39 : 4.61]
<b>Religion</b>				
Hindu				
Muslim		-0.88[-2.73 : 0.97]	-0.37[-2.23 : 1.49]	-1.64 [-3.46 : 0.18]
<b>Caste</b>				
Sc/St				
OBC		0.64[-0.91 : 2.18]	0.65[-0.9 : 2.19]	0.49 [-0.99 : 1.96]
Otherwise		0.47[-1.44 : 2.38]	0.73[-1.21 : 2.67]	-0.21[-2.09 : 1.66]
<b>Marital Status</b>				
Currently not married				
Currently married		1.74*[0.36 : 3.13]	1.46*[0.07 : 2.84]	1.23[-0.09 : 2.55]
<b>Wealth Quintile</b>				
Low				
Middle		-0.16[-1.69 : 1.37]	0.51[-1.08 : 2.09]	0.97[-0.56 : 2.49]
High		-1.39[-2.96 : 0.19]	-0.35[-2.05 : 1.35]	0.41[-1.23 : 2.06]
<b>Health Behavior</b>				
<b>Diet</b>				
insufficient				
sufficient			2.25**[0.82 : 3.68]	1.22[-0.19 : 2.64]
<b>Smoking</b>				
Never smoke				
Ever/currently smoking			-0.41[-1.75 : 0.94]	-0.25[-1.54 : 1.04]
<b>Alcohol consumption</b>				
Never				
Ever/currently			1.54[-0.17 : 3.25]	1.04[-0.6 : 2.68]
<b>Psychological Factor</b>				
Happiness				0.25*[0.02 : 0.49]
Life satisfaction				0.22**[0.06 : 0.39]

p<.001\*\*\*; p<.01\*\*; p<.05\* [Model 1: Biomedical & generic factor; Model 2: Model 1+ Socioeconomic factor; Model 3: Model 2+ Heal behavior factor; Model 4: Model3+Psychological factor]

**Figure 1: Age specific subjective life expectancy**



**Figure 2: subjective life expectancy by observed life satisfaction and level of Happiness**

