

## Subjective Wellbeing and Mindfulness as Concomitants of Physical Health among Older Adults in India

Vaidya M\* and Biswas UN

*Department of Psychology, Faculty of Education & Psychology, The MS University of Baroda, Vadodara, Gujarat, India*

\***Corresponding Author:** Vaidya M, Research Scholar, Department of Psychology, Faculty of Education & Psychology, The MS University of Baroda, Vadodara, Gujarat, India, Tel: +91-9737422624, E-mail: madhuri.vaidya@gmail.com

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### ABSTRACT

Global average life expectancy has increased by 5 years between 2000 and 2015, which is the fastest increase since 1960 (World Population Ageing 1950-2050, UN Population Division, DESA, 2015). The World health Organization recognizes health and wellbeing as key parameters for successful ageing across the globe. However, there are very few research reports from the developing and highly populated countries like India documenting the relationship between physical health and subjective wellbeing among the older population. The primary objective of the present research is to study the effect of mindfulness, subjective wellbeing on the physical health of older people. The measures of physical health parameters were developed with consultation and verification from general health practitioners followed by a pilot testing of the compiled questionnaires. The sample for the final research comprised of 436 older adults between 60 and 70 years, who were chosen from selected areas of Mumbai and Pune, two major cities from Western India. The researchers used available standardized scales for assessment of subjective well-being and mindfulness. The physical health assessment consisted of parameters like physical fitness, systemic/sensory parameters, lifestyle habits, chronic medical condition and biomarkers. It was hypothesized that mindfulness and subjective wellbeing will have a significant positive relationship in older adults and both parameters will have significant effect on physical health parameters of the older adults. Pearson product moment and multiple regression analysis was carried out which resulted in the rejection of the first hypothesis. Subjective wellbeing was found to have significantly affected all the physical health parameters except lifestyle habits whereas mindfulness affected the lifestyle habits of the older adults. The implications of the research are discussed in the context of fostering physical health of older adults through promotion of subjective wellbeing and mindfulness.

**Keywords:** Subjective wellbeing; Mindfulness; Physical health; Older Adults; India

**List of abbreviations:** UN: United Nations; DESA: Department of Economic and Social Affairs; MOSPI: Ministry of Statistics and Programme Implementation

## Introduction

The World Health Organization has recognized health and wellbeing as the two important factors for successful ageing. Globally, 'ageing population' is a major area of research as the average life expectancy has increased by 5 years in the period 2000 to 2015. Higher life expectancy on account of lower mortality and lower fertility have resulted in the relative weight towards the older cohort. Currently India has 17.73% of the world's ageing population and it is expected to take the first place on this population metric by 2050. The 60+ and 80+ cohorts are projected to grow from 7.6% and 0.6% in the year 2000 up to 20.6% and 3.1% respectively, in the year 2050 and this would overwhelm the already overburdened public health system [1].

The process of ageing, brings along with it a certain degree of physical, emotional and psychological limitations leading to a growing dependency and is hence perceived negatively. Older adults experience loneliness, emotional neglect and lack of physical support on account of factors like urbanization, and the national and international migration of the working age population they are dependent on [2]. In the Indian context the major cause of poor health is on account of fall (14% to 53%) in the late adulthood stage, which leads to functional disability and physical dependency [3]. Falls are a result of biological factors such as reduced physical strength, physical balance, sensory functioning accompanied at times with chronic ailments as well as behavioral risk factors such as hurrying, reduced physical activity and dependency on multiple medicines. Overall, these factors result in poor quality of health among older adults [4,5].

Gerontologist's today focus on 'functionality' rather than 'chronology' and this has widened the scope of successful ageing through enhanced wellbeing [6]. One of the important issues to be addressed is physical health which would complement wellbeing in the later stage of life [7]. Physical health which is reflected in physical fitness refers to the ability to carry out daily tasks with vigour and alertness as well as to have ample energy to enjoy leisure time activities or deal with unforeseen emergencies. Health-related elements such as muscular strength and endurance, body composition, flexibility and physical fitness and skill-related elements such as agility, balance, speed, power, coordination and reaction time are the primary contributors to physical health thereby enabling prevention of chronic disease and rehabilitation in older adults. These elements also promote independent functioning and better quality of life [8].

The research also addressed is subjective wellbeing in older adults. The subjective democracy of evaluating one's quality of life on a cognitive and affective level is labelled as 'subjective wellbeing' [9]. A bidirectional relationship is found between subjective wellbeing and physical health in older adults. In a review article based on Gallop studies, premature death, coronary heart disease, diabetes and other chronic conditions are found to be associated with an impaired psychological wellbeing [10].

The mental state theories, theories of self-regulation and the hedonic tradition in Psychology have highlighted the role of quality of the consciousness in the maintenance and enhancement of the well-being. Mindfulness meditation nurtures consciousness by non-judgmental observation of every phenomenon, resulting into behaviour regulation and well-being [11]. Greater awareness, clarity in thoughts, feelings and attitudes are some of the benefits of mindfulness allowing the individual accept the reality, appreciate feelings of joy, peace and happiness [12].

## Rationale

At country level, there are efforts by the policy makers to create conducive environment and amenities to meet social and economic challenges of the older adults to address the public health issues of the population ageing. However, this effort will be successful only if the older adults themselves strive to maintain good physical health and be happy in life. The existing literature in the field has shown association between mindfulness, wellbeing and health. Mindfulness provides simple but powerful route for getting oneself unstuck and take charge of one's life which leads to a sense of subjective wellbeing. Subjective wellbeing has been recognized as one important aspect of successful ageing. This study examines the relevance of subjective wellbeing and mindfulness as concomitants of physical health of older adults in India with the possible implication of identifying at-risk olds for physical fitness and design intervention programme for promoting subjective wellbeing and mindfulness which eventually culminates in better physical health.

## Objectives

To understand the relationship between mindfulness, subjective well-being and physical health among older adults in the age group of 60 and 70 years.

To study the effect of mindfulness and subjective well-being on the physical health in terms of physical fitness, systemic and sensory parameters, lifestyle habits, chronic medical condition and biomarkers of older adults.

## Hypotheses

The following hypotheses are conjectured based on these objectives and available literature:

H0. There is no significant relationship between mindfulness and subjective wellbeing of older adults

H0. Mindfulness and subjective wellbeing will have no effect on the physical fitness parameters of older adults

H0. There will be no effect of mindfulness and subjective wellbeing on the systemic/ sensory parameters of older adults.

H0. Mindfulness and subjective wellbeing will not have significant effect on the life style habits of older adults.

H0. Mindfulness and subjective wellbeing will not have significant effect on chronic illness among older adults.

H0. Mindfulness and subjective wellbeing will not have significant effect on biomarkers of older adults.

## Material and Method

The study used a survey method for collection of data.

### Sample description

The sample comprised of 436 young older adults in the age range of 60 to 70 years. The research followed a multistage sampling procedure, where initially some localities from Mumbai and Pune city were selected randomly. In the second stage older adults who fulfilled the criteria of being in the age range of 60 to 70 years of age without any diagnosis of acute physical or mental illness were contacted randomly. The inclusion criteria were - Older adults without any major psychopathological problems and locomotive disability. Older adults who agreed willingly for the physical health assessments to be carried out by the researcher, and to participate in the study were chosen for the research and approached personally by the researchers.

The socio demographic break-up of the sample is as follows:

### Tool description

The data were collected through a compiled questionnaire which included the following measures. Apart from that in consultation with gerontologists and physicians, the researcher developed various assessments for physical health parameters which are described below. The psychological tools are:

**Five Facet Mindfulness Questionnaire-15:** 15-item Five-Facet Mindfulness Questionnaire developed by Baer et al. (2008), a short form of the 39-item FFMQ is a self-reported measure of dispositional Mindfulness. It includes the same five facets as the long form: Observing, Describing, Acting with Awareness, Non-Judging of inner experience, and Non-Reactivity to inner experience. The test consists of 15 items on five different dimensions developed on a five point Likert scale. Each Facet is being measured by 3 items. The factor structure of the FFMQ-15 was consistent with that of the FFMQ-39, internal consistency with alpha coefficients ranging from .75 to .91 and there were large correlations between total facet scores of the short and long forms of the scale. The Cronbach alpha was found to be .81 for the present sample in the study.

| Variables                  | Categories  |                       |                    |                         |                                   |
|----------------------------|-------------|-----------------------|--------------------|-------------------------|-----------------------------------|
| Age (436)                  | 60 - 65     | 66-70                 |                    |                         |                                   |
|                            | 210         | 236                   |                    |                         |                                   |
| Gender (436)               | Male        | Female                |                    |                         |                                   |
|                            | 193         | 243                   |                    |                         |                                   |
| Education (436)            | SSC         | Graduate              | Post Grad          | Any Other               |                                   |
|                            | 195         | 155                   | 74                 | 12                      |                                   |
| Socio Economic Status(436) | <10,000     | 10,000-20,000         | 20,000- 50,000     | >50,000                 |                                   |
|                            | 155         | 88                    | 124                | 69                      |                                   |
| Marital status 436)        | Single      | Married               | Widowed            | Divorcee                |                                   |
|                            | 38          | 285                   | 110                | 03                      |                                   |
| Place of stay (436)        | Institution | Home (with family)    | Home (with spouse) | Home alone              |                                   |
|                            | 103         | 186                   | 130                | 17                      |                                   |
| Working status (436)       | Home maker  | Working in continuity | Retired            | Retired & working again | Retired& not n gainful employment |
|                            | 136         | 68                    | 163                | 44                      | 25                                |

**Table 1:** Socio-demographic break-up of the sample (N=436)

**Subjective Wellbeing Inventory** is a 40 item measure of feelings of well-being/ill-being as perceived by an individual in different aspects of life constructed by Nagpal & Sell in 1992. Eleven factorial dimensions of life are measured on 3 point Likert scale. The scale has .79 test-retest reliability with inter-rater reliability and inter-scores reliability and .83 validity. The Cronbach alpha was found to be .91 for the present sample in the study.

**Physical health Parameters:** Different aspects of physical health and fitness among people aged 60 to 70 years assessed by five categories are as follows -

**Physical fitness parameters:** Physical fitness parameters such as Flexibility, Agility, Balance, and Speed of work, Aerobic endurance and Muscular endurance were measured with the help of Senior Fitness Test specifically designed for older adults by [13]. The participants were given different physical tasks such as-

Chair Sit-and-Reach task for measuring body flexibility in which the participant was asked to sit on the chair and try to touch the toes. The task primarily measures upper body flexibility which is required for the older adults to maintain good posture, gait patterns and perform normal mobility tasks and thus do housework independently.

8-Ft Up-and-Go task was given to measure agility which is important in tasks that require quick maneuvering in the house as well as doing shopping, travelling and in particular physically reacting to any emergency situation by getting up and start walking as soon as possible. In this task, the participant was asked to sit on a chair comfortably and after the 'ready' signal given by the researcher, was asked to get up and walk for 8 feet distance. The time taken to react and complete the given task was measured.

30-second chair-stand exercise was given to measure the physical balance and lower body strength in which the participant was asked to sit on a chair comfortably and after the 'ready' signal given by the researcher, was asked to get up without any support and stand, repeat the action till the researcher gave the 'stop' signal. The number of stands in 30 seconds was measured indicating the degree of physical balance in the older adults.

Speed of work was inferred by the time taken by the participant in the 8-Ft Up-and-Go task using the formula, Speed = Distance / Time.

Arm curl task measured the muscular endurance of the old by the number of bicep curls that can be completed in 30 seconds. For

practical and convenience purpose, the researcher slightly manipulated the task from the original task given in the senior fitness test. The participant was instructed to create resistance in the arm to be folded with the help of pressing the fingers of another hand.

An aerobic endurance was measured with the help of 2-minute walk test in which the participant was asked to either climb the stairs or do spot jogging continuously for maximum of 2 minutes. Those who found it difficult to do, were allowed to discontinue the task in the interest of their health. The number of steps completed in 2 minutes was a measure in a task.

Each task mentioned above is helpful in the independent living of the older adults.

**Systemic/ Sensory parameters:** Included the respiratory problems, bowel movements and problems related to vision and hearing.

**Lifestyle habits:** The participant's status on different lifestyle habits such as smoking, sniff, drinking, gutka, supari was noted down.

**Chronic medical condition:** Whether the participant was suffering from any chronic illness was noted down by the researcher.

**Biomarkers:** Deficiency or excess level of Lipid profile along with functioning of endocrine glands, blood sugar was recorded.

## Procedure

The research proposal was passed through the Faculty Research Committee (FRC) of Faculty of Education and Psychology, The M.S. University of Baroda for ethics approval. The committee was chaired by the Dean of the Faculty, and there were seven votes including the votes of three subject experts. The approval was given on 10<sup>th</sup> October, 2018 (letter No FEP/Psy/ dated 10.9.2018) and the data were collected between June, 2019 and May, 2021. Because of the COVID-19 global pandemic, visiting each one of the participants, getting the physical assessment done, was a real challenge for the researchers. Ethics protocols were followed by taking informed consent and assuring full confidentiality to each participant. The researchers gave basic outline of the study and then the consent for responding to the questionnaires and performing the necessary physical tasks was obtained prior to the collection of the demographic information.

The areas of Municipality of Mumbai Metropolitan city and Pune city were selected randomly. Within these areas, researcher approached functionally healthy and willing older adults. After establishing personal contact, individuals who agreed to the assessment of their physical health were considered for the sample.

In case of the data collected from the institutionalized older adults, an organizational permission was obtained prior to the individual participant's consent to respond to the questionnaire and performing the physical tasks required in the research.

After establishing rapport, the researchers collected demographic information with the help of a prepared questionnaire. Prevalence of any disease was noted down, if at all, with its nature, duration, frequency and intensity. Both the tests were administered with 10 minutes interval to avoid fatigue effect and the checklist to measure the physical health parameters was given followed by the physical tasks to the participant. Then the data were compiled and analysed with appropriate statistical measures.

**Statistical evaluation:** Pearson Product moment correlation was used to study the relationship between subjective wellbeing, mindfulness and physical health. The multiple regression analysis was done to find the effect of subjective wellbeing and mindfulness on the physical health of old adults. Statistical analyses were performed on SPSS version 21.

## Results

| Variables                    |          | Mean (SD)     | Mindfulness   | Subjective wellbeing | Systemic/ Sensory parameters | Lifestyle habits | Chronic medical condition | Bio markers   |
|------------------------------|----------|---------------|---------------|----------------------|------------------------------|------------------|---------------------------|---------------|
| Mindfulness                  |          | 52.67 (9.68)  |               |                      |                              |                  |                           |               |
| Subjective wellbeing         | r<br>Sig | 91.36 (15.60) | .64 **<br>.00 |                      |                              |                  |                           |               |
| Systemic/ Sensory parameters | r<br>Sig | 12.48 (1.98)  | .18 **<br>.00 | .26 **<br>.00        |                              |                  |                           |               |
| Lifestyle habits             | r<br>Sig | 29.10 (2.13)  | .09<br>.06    | -.01<br>.91          | .04<br>.43                   |                  |                           |               |
| Chronic medical condition    | r<br>Sig | 21.17 (1.39)  | .07<br>.16    | .15 **<br>.00        | .18 **<br>.00                | .07<br>.14       |                           |               |
| Biomarkers                   | r<br>Sig | 30.60 (1.87)  | .01<br>.77    | .15 **<br>.00        | .40 **<br>.00                | -.02<br>.72      | .22 **<br>.00             |               |
| Physical fitness parameters  | r<br>Sig | 11.99 (3.72)  | .23 **<br>.00 | .34**<br>.00         | .32 **<br>.00                | -.02<br>.69      | .28 **<br>.00             | .25 **<br>.00 |

Note: \*p<.05, \*\*p<.01

Table 2: Mean, SD and r value of the Psychological and Physical Health Variables

Table 2 displays the Mean and SD of each parameter in the first column and the second column onwards, it presents the correlation coefficients and its significance (p value). The values in table 2 show significant positive relation between subjective wellbeing and mindfulness. However, subjective wellbeing is found to be significantly associated with all the different dimensions of physical health such as the physical fitness parameters, systemic /sensory parameters, chronic medical condition and biomarkers except the lifestyle habits. The results were presented with 95% confidence interval and the significant level was set as 5% level.

In order to test the effect of mindfulness and subjective wellbeing on different dimensions of physical health such as physical fitness parameters, systemic/sensory functioning, lifestyle habits, chronic medical condition and biomarkers among the older adults, linear regression analysis was carried out. The results are presented below:

|                         | Physical Fitness parameters |                | Systemic/ Sensory parameters |                | Lifestyle habits |                | Chronic medical condition |                | Biomarkers |                |
|-------------------------|-----------------------------|----------------|------------------------------|----------------|------------------|----------------|---------------------------|----------------|------------|----------------|
|                         | Std. Beta                   | t value (Sig.) | Std. Beta                    | t value (Sig.) | Std. Beta        | t value (Sig.) | Std. Beta                 | t value (Sig.) | Std. Beta  | t value (Sig.) |
| Mindfulness             | .02                         | .37 (.71)      | .02                          | .27 (.79)      | .16              | 2.55** (.01)   | -.05                      | -.73 (.46)     | -.14       | -2.20 (.03)    |
| Subjective Wellbeing    | .33                         | 5.59** (.00)   | .25                          | 4.15** (.00)   | -.11             | -1.71 (.09)    | .17                       | 2.81** (.00)   | .23        | 3.79** (.00)   |
| F                       | 28.56**                     |                | 15.69**                      |                | 3.25*            |                | 4.90**                    |                | 7.22**     |                |
| R                       | .34                         |                | .26                          |                | .12              |                | .15                       |                | .18        |                |
| R <sup>2</sup>          | .12                         |                | .07                          |                | .02              |                | .02                       |                | .03        |                |
| Adjusted R <sup>2</sup> | .11                         |                | .06                          |                | .01              |                | .02                       |                | .03        |                |

Note: \*p<.05, \*\*p<.01

Table 3: Subjective Wellbeing and Mindfulness as Predictors of Physical Health Parameters

Table 3 presents the results of the multiple regression analysis conducted to see if mindfulness and subjective wellbeing predicts the physical health parameters of older adults. The values in the Table 3 show subjective wellbeing to be a significant predictor of all the dimensions of physical health except lifestyle habits of older adults. However, mindfulness significantly predicts only the lifestyle habits and not any other dimension of physical health.

**Physical fitness parameters:** The F value shows mindfulness and subjective wellbeing as significant predictors of physical fitness among older adults. Mindfulness and subjective wellbeing together explain 11% variance in physical fitness parameters of the older adults. Although subjective wellbeing significantly predicts physical health, mindfulness does not individually contribute significant variance in the physical health of older adults.

**Systemic / sensory parameters:** The F value in the above Table indicates significant effect of mindfulness and subjective wellbeing on the systemic / sensory parameters of physical health in older adults. Although together mindfulness and subjective wellbeing could explain 6% variance, regression analysis shows subjective wellbeing significantly contributes to the systemic/ sensory parameters of physical health among the older adults at .00 level.

**Life style habits:** Mindfulness and subjective wellbeing together explain only 1% variance, the F value indicates the effect on the lifestyle habits which is one of the dimensions of physical health of the olds. The t value shows mindfulness is leading to significant effect on the lifestyle habits and not the subjective wellbeing among the older adults.

**Chronic medical condition:** Although mindfulness and subjective wellbeing together could explain 2% variance, the F value shows their effect on the chronic medical condition of the older adults. The regression analysis shows that the subjective wellbeing significantly predicts the chronic medical condition of older adults; whereas mindfulness does not individually contribute significantly to the chronic medical condition of the older adults.

**Biomarkers:** The above figures show that mindfulness and subjective wellbeing together cause 3% variance, the significant F value shows their effect on the biomarkers among the old adults. The regression analysis indicates subjective wellbeing as the predictor.

## Discussion

In the present study, the researchers aimed to examine the association between mindfulness, subjective well-being and physical health among older adults. Pearson Product moment correlation( $r$ ) was used to study the relationship. It was hypothesized that 'There will be no significant relationship between mindfulness and subjective wellbeing of older adults' is rejected by the results in the present study.

Mindfulness is a state of physical and mental being and experiencing every moment with receptivity and openness, promoting active search for novel experiences. Such enhanced state of metacognitive awareness helps to re-perceive one's thoughts and emotions and view them as passing mental events. It helps to reduce rigidity and promotes openness to experience. Being non-judgemental leads to acceptance of the situation and happiness [14], regular practice of mindfulness helps to take care of one's emotional needs and overall health leading to an experience of positive emotions and happiness [15]. One of the outstanding effects of mindfulness is increased subjective wellbeing and behavioural regulation [16].

Rumination, absence of let go attitude are major cognitive processes in most common psychological illness. Mindfulness helps individual to get unstuck and consider every moment as a passing event in life which enables to live with satisfaction [17]. In an experimental study done by [18] on mindfulness and wellbeing, the three months intervention of mindfulness meditation showed significant increase in the wellbeing. Mindfulness helps to disconnect from the emotional upset and allows focusing on a given task which promotes satisfaction [19].

Wellbeing benefits physical health on a wider spectrum such as promoting physical fitness, coping with the chronic illnesses more effectively and managing physiological health parameters. Positive affect and life satisfaction are more important com-

ponents influencing the physical health [20]. Research demonstrated wellbeing having positive impact on short term and long term health outcomes as well as disease or symptom control [21].

Subjective wellbeing not only reduces the possibility of illness but also promotes positive health outcomes. Overall wellbeing enhances the functioning of immune system, improves pain resistance and protects the individual from cardiovascular illness buffering the impact of stress on health. Psychological wellbeing is significantly associated with reduced cardiovascular mortality in healthy population and reduced death rates in the diseased population which proves favourable effect of wellbeing on the survival [22].

**Physical fitness parameters** studied in the present research were flexibility, agility, balance, speed of work, aerobic and muscular endurance among the older adults. The null hypothesis which states that 'mindfulness and subjective wellbeing will have no effect on the physical fitness among the older adults' is rejected by the findings given in the Table 3.

Happy people to be more concerned about their health parameters including weight, ease of movement through more activity leading to physical fitness and resilience and build more resources [23]. It is reported that perceived wellbeing connects with pathways to health in terms of controlling hypertension and cholesterol level and improving the immune function, endocrine activity and few physiological measures through alterations in health behaviour such as sleep, exercise and diet [20]. An intervention study titled 'Parkinson's disease wellbeing programme' held for 5 weeks reports that, patients with mild to moderate Parkinson's disease showed significant improvement in the physical health parameters such as flexibility, agility and strength post intervention. The wellbeing of the patients was enhanced through education and exercise during the intervention stages of the study [24].

The falls, if not fatal, cause dysfunctionality in old age making the adults dependent on others. A comprehensive programme of strengthening, balance, and/or endurance training effectively reduces falls and fall risks in older adults. Exercises alone are effective in reducing fall rates in older adults in community and home –based older adults [4].

Cardiorespiratory and muscular endurance, muscular strength, body composition and flexibility are the health-related elements of physical fitness; while agility, balance, speed, power, coordination, reaction time are all skill-related contributors. Both health-related and skill-related components are important in the prevention of chronic disease as well as rehabilitation among older adults. They are particularly critical to independent functioning and better quality of their life [8].

**Systemic / Sensory parameters** considered in the present study comprised of respiratory problems, bowel functioning, and the problems related to vision and hearing among the older adults.

Respiratory muscle strength decreases with age and hence shows functional changes as well, probably responding poorly to moderately to medication. The older adults show reduced ventilator response to hypoxia or similar states, with more possibility of poor outcomes [25]. Hence, various alternate therapies are experimented to test their effectiveness. Sensorimotor performance shows decline during old age but can improve by training and exercise indicating that age-related changes are treatable. Dance therapy is one of the powerful interventions as it works on cognitive, affective as well as physical levels. It is effective in acoustic stimulation as well as cognitive performance in older adults without affecting cardio-respiratory functioning [26].

More than 40% of older adults show age –related digestive symptoms. The most common digestive-health problems are irregular or painful bowel movements, constipation which may eventually affect health [27]. Functional bowel disorders impair daily life and quality of life among older adults. Bowel related problems like constipation tend to affect moods, day to day activity and social life from moderate to a large extent [28,29]. Normally, lack of proper diet, exercise and insufficient quantity of fluids are the major causes of constipation or other bowel related problems. Adequate and appropriate diet, regular physical exercise are considered to be the mood additives which contribute to the functioning of physiological processes such as digestive functioning which eventually help to take care of bowel related problems [30]. Particularly in older adults, psychological factors like anxiety, stress or even fear of bowel functioning cause disturbances such as irritable bowel syndrome. Therefore, stress reduction is one of the effective measures suggested to manage the IBS [31].



Clinical reports and the current research suggest that 'stress is both, a cause and consequence of vision loss'. Stress is found to be a determinant of hypoxia, retinal impairment, partial and selective blindness eventually affecting the health and quality of life in older adults. Therefore, taking care of mental health and avoiding negative impact of inevitable stress is highly suggested [32].

Adequate functioning of sensory capacities is an important dimension of physical health as it reflects in numerous activities of the person in particularly later years of life. The loss of vision due to damaged optic nerve or retina can cause difficulties in day to day activities like reading, recognizing, socializing etc. It can also lead to partial or complete dependency and affect mobility to a large extent. Hence, relaxation techniques, stress reduction mechanisms are recommended to be adopted to prevent or manage the loss of vision [11,33].

An impairment in the sense of hearing is another important cause of making the older adults socially aloof with lot of dependency and restriction on mobility leading to poor quality of life [34,35]. Sensory-neural hearing loss is normally age related. Tinnitus is a common hearing problem induced by stress across the age. Hence, stress management is said to be effective in managing with the hearing loss such as tinnitus. The findings in the above research indicate significant effect of mindfulness and subjective wellbeing on the systemic / sensory parameters of physical health in older adults rejecting the null hypothesis which states that 'there will be no effect of mindfulness and subjective wellbeing on the systemic / sensory parameters of physical health of older adults'.

**Lifestyle habits:** The results refute the null hypothesis which states that 'mindfulness and subjective wellbeing will not have effect on the lifestyle habits of older adults' in the present research. Findings suggest that mindfulness and subjective wellbeing have significant effect on life style habits.

The past researches have shown benefitting effect of mindfulness in controlling or reducing the lifestyle habits such as consumption of gutka, supari, alcohol, habits like smoking, snuff etc. in adolescents and adults, but not specifically in the older population. Globally, lifestyle habits such as smoking, consumption of tobacco / gutka are the leading causes of death across the age. By 2030, particularly in developing countries the number of such deaths is projected to be 10 million, and hence a growing public health concern. Despite various measures taken by the policy makers like restrictions or bans on its publicity and behaviour, easy availability to cessation therapies is found to be effective [36,37].

Although in the present research subjective wellbeing is not found to be directly related with lifestyle habits affecting physical health, earlier research has suggested unhappiness to be a leading cause for later smoking in adolescents. Similar to heavy smoking, heavy drinking was found to be associated with unhappiness in adolescents [23].

Neuropharmacological study [38] claims that when smoking or drinking is induced by stress, the prefrontal cortex shuts down. In such situations, changing the habit loop with the help of mindfulness technique works by making the individual aware of immediate effects of smoking / drinking such as 'burning feeling' while inhalation / consumption, breaking the habit loop. An experimental study conducted by [39] shows promising effect of in-person Mindfulness-Based Addiction Treatment (MBAT) for smoking cessation as well as lapse recovery along with text messages between the sessions in the treatment. Strong retention was achieved 76% among 2/3 of the participants at the end of treatment, and 89% among majority of the participants was seen at 1-month follow-up distinctly showing the effect of mindfulness on lifestyle habits like smoking and drinking. Similar findings are reported suggesting significant reduction in smoking and the retention of the same [36].

Mindfulness Training for Smokers (MTS) proves to be effective in reducing the frequency of smoking and alcohol use, if not complete cessation in young adults who either smoke or abuse alcohol [40]. Mindfulness treatment is found to be a positive intervention for substance use disorders showing significant small effect on its reduction and medium effect on reducing craving [41].

**Chronic medical condition:** A longitudinal study on ageing reported that wellbeing helps to avoid the onset of chronic diseases such as arthritis, cancer, stroke, diabetes, myocardial infarction, and chronic lung disease among the older adults [42]. Longevity is found to be an outcome of hedonic as well as eudemonic wellbeing particularly in community dwelling Chinese older adults.

Greater purpose in life is associated with more positive outlook towards life that may help an individual to counter the negativity which is a byproduct of chronic illness [43].

Research on the impact of positive affect and attitudes on the development of chronic disease reports that the people with less life satisfaction being more prone to suffer from cancer [44,45]. While people with intense negative affect showed high incidence for coronary disease; positive affect did not guarantee an absence of the same [46].

An Australian longitudinal study on women's health highlighted the role of wellbeing in terms of lack of perceived stress in the life leading to less vulnerability to arthritis development [47]. Stroke, cardiac and chronic lung disease were positively related with depression among the old adults [48]. Positive affect was found to be inversely associated with the incidence of stroke in case of older adults, which showed the role of emotional wellbeing as a protector of chronic illness [49].

Wellbeing is positively associated with restorative behaviour and biological function other than hedonic wellbeing specifically related to cardiovascular health [50]. On the other hand, bidirectional relationship between subjective wellbeing and physical health is found in older adults. Retrospective studies show an evidence of impaired psychological wellbeing which is related to increased risk of premature death, physical illnesses like coronary heart disease, diabetes and other chronic conditions. Regular physical activity is suggested to maintain cardiovascular health, muscle strength and flexibility which is consistently correlated with wellbeing [10].

Sudden or repeated falls affect physical health in the form of physical immobility, complete or partial dependency, if not death among older adults. The frequency of falls increases along with the age and other comorbidity, higher in institutionalised older adults than older adults staying at home. In the present study along with chronic illness, even few cognitive disabilities such as Dementia, Parkinsonism are investigated. Such cognitive impairments show double rate of prevalence of falls as compared to their counterparts [51].

Although findings in the present study do not show significant effect of mindfulness on chronic illness as a dimension of physical health, previous research has reported significant effect of mindfulness on physiological level in the form of improved functioning of immune system, lowered blood pressure, lowered levels of blood cortisol and increased resistance to stress-related diseases [52].

The null hypothesis stating 'mindfulness and subjective wellbeing will show no effect on the chronic medical condition of the old' is rejected by the findings in the present study.

**Biomarkers:** The electrolytes play an important role in the nervous system and motor functioning. Imbalance of electrolytes can lead to disruption of normal body functioning or even be life threatening. Overall fatigue, excessive weakness, cardiac disease, kidney malfunctioning are to name a few with age related changes in the homeostatic mechanisms more in older persons [53].

Physical inactivity, certain health problems and more importantly stress are the major causes of Type II diabetes, commonly found in older people. Stress is a potential factor influencing blood sugar level. It has been a proved fact that stress can induce both hyperglycemia and hypoglycemia affecting physiological functioning and behavior. However, the duration and nature of stress also matter in determining its effect. The impact of stress on diabetes depends upon psychosocial factors such as one's perception of the stressful situation and or psychological, social support. Individuals support from having psychosocial support [54,55]. The studies show that such issue can be effectively addressed by promoting lifestyle and behavior changes in 'diabetes prevention programme'. The Diabetes Attitudes Wishes and Needs Programme (DAWN programme) has highlighted the role of psychosocial and behavioural barriers in the treatment of the disease [56,57].

There are ample evidences of how the bio-markers get influenced by lifestyle and behavioral factors. Thyroid hormone has important neural implications. Different symptoms like depression and anxiety are closely associated with thyroid dysfunction, both hypo and hyperthyroidism showing the effects on cognitive, affective and behavioural level. Therefore, addressing such psychiatric manifestations will show augmenting effects in the treatment of subclinical thyroidism [58,59].

Lipid levels are also influenced by lifestyle and behavioural factors or conditions in individual's life. Low cholesterol concentration (HDL) is found to be associated with anxiety and depression and more importantly vulnerability to stress. On the other hand, physical activity, positive emotion, aesthetics, actions, and deliberation were associated with triglycerides [60]. High amount of cortisol release is a product of stress leading to increase in blood cholesterol and triglycerides apart from blood sugar and blood pressure. In an experimental study conducted by [61] on the clinical patients with and without history of early life stress observed the significant negative association between the severity of early life stress and HDL, whereas early life stress being significantly positively related with Triglycerides.

Thus, the results in the present study reject the null hypothesis which states that 'mindfulness and subjective wellbeing will not have effect on the biomarkers of the old'.

**Significance of the present research:** Majority of the existing researches have been done in the Western context focusing on the older population in general. However, the present research has focused on the physical health of older adults aged 60 to 70 years through their subjective wellbeing and mindfulness as precursors in the Indian context. The sample in the study has a wide representation from all sorts of socio demographic backgrounds including old adults staying at own home and institutions. The study findings may be indicative of wellbeing mindfulness, and physical health of adults living in Indian cities.

**Strengths and Limitations:** The assessment of physical health parameters created significant awareness about the need and importance of maintaining physical fitness among the older adults. The data was collected by the home-based as well as institutionalized older adults in person by the first author which gives the authenticity and validity of measures of physical health parameters. When adjunctive therapeutic practices and preventive measures are encouraged for promotion of health and wellbeing of disadvantaged and population at risk by public health professionals, the findings from this research have practical applications for designing interventions to address successful ageing among institutionalized and home based elderly population.

However, the research has the limitation of being carried out on the older adults from urban areas in Western India. COVID-19 Pandemic had certain restrictions in accessing older adults from other distant places and also from rural areas. In addition, the research has limited itself to the older adults in the age group of 60 to 70, which works as a delimitation. A comparative analysis of different age groups of older adults could have provided results generalizable for a large population of ageing adults.

**Implications:** The study assumes importance of mindfulness and well-being in the physical health of the older adults. The findings of the study could be used for institutionalized older adults by designing low cost psychological interventions to promote mindfulness and subjective wellbeing, which in turn can prepare them in good stead to maintain physical health and avoid age related health complications. In addition, simple psycho educative awareness programme for older adults in communities can impart skills for assessment of physical fitness and work towards it to avoid old age health problems. Together, such initiatives adopted by elder care institutions and health professionals may contribute significantly to the promotion of public health in a middle income, populous country like India.

## Conclusion

The present study implies direct positive relationship between mindfulness, subjective wellbeing and physical health of the older adults. The findings suggest subjective wellbeing as a concomitant of physical health of the older adults in terms of their physical fitness, systemic/ sensory parameters, chronic medical condition and biomarkers except lifestyle habits, whereas; mindfulness contributes effectively to explain the lifestyle habits of the older adults. Prevention is better than cure, and it is particularly true in the domain of public health issues. The study suggests the importance of creating awareness about the parameters of physical fitness and health among the ageing population, so that; they can self-assess and take care of themselves to support successful ageing in the community as a positive parameter of public health.

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