WHO Collaborating Centre for Traditional Medicine

Morarji Desai National Institute of Yoga
Ministry of Ayush, Government of India

YOGA FOR GERIATRIC POPULATION

ACTIVITY OF WHO CC -TM (Yoga)-IND 118

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Yoga for Geriatric Population

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MESSAGE

I am delighted to present **"Yoga for Geriatric Population",** published as a part of the WHO Collaborating Centre (WHO-CC) in Traditional Medicine (Yoga) activity.

Morarji Desai National Institute of Yoga (MDNIY) has been designated as the WHO Collaborating Centre for Traditional Medicine (Yoga) in India since April 2013. The institute serves as an effective Yoga resource centre for information exchange on Yoga and plays a prominent role in developing Yoga standards to promote rational practice.

There has been an upsurge in global demand for authentic information and knowledge about Yoga worldwide, particularly after the United Nation's declaration of 21st June as the International Day of Yoga on 11 December 2014.

MDNIY has developed this book after an extensive review process, which is reflected in the quality of the content and its presentation, making this book a great source of knowledge and information.

This book will be a significant addition to the existing repertoire of knowledge bringing to the forefront new ideas, developments, and trends in the field of Yoga to promote all aspects related to holistic health and well-being in Geriatric Population.

The collaborative project with WHO has also prepared a mobile app WHO mYoga App. This app carries videos of various Yoga practices performed by trained professionals, with the objective of guiding Yoga aspirants.

All these efforts are aligned to make Yoga accessible to everyone, particularly Geriatric Population. This publication would go a long way in opening new vistas and adding further depth to the subject.

I congratulate the Director, MDNIY, and his team for their untiring effort in putting together this useful publication. I hope it will go a long way in imparting yogic values and practices to lead healthy and meaningful life.

(Rajesh Kotecha)

Date: 19.06.2023

PREFACE

WHO Collaborating Centre in Traditional Medicine (Yoga) -IND 118 of Morarji Desai National Institute of Yoga (MDNIY), Ministry of Ayush, Government of India, takes pride in contributing to its WHO-CC activities through this book entitled "Yoga for Geriatric Population."

WHO has recognized the important contribution of traditional medicine in providing essential health care. In view of supporting WHO in the development of WHO benchmarks for training in Yoga, Morarji Desai National Institute of Yoga, New Delhi, has been designated as WHO Collaborating Centre in Traditional Medicine (Yoga)-IND 118 in India. MDNIY, as the collaborating centre for traditional medicine (Yoga), aims to harness the potential of traditional medicine through modern science, research, and technology to improve the health and wellness of people and make preventive and curative healthcare, affordable and also accessible to all.

The objectives of the WHO Collaborating Centres are diverse and include the collection, and dissemination of information on Yoga, standardization of terminology, methods, and procedures, generating evidence-based information on the safety, quality, and cost-effectiveness of traditional medicine products and therapies, development, and application of appropriate technology, provision of reference substances and other services, participation in collaborative research as well as capacity building through various training programmes.

The book, "Yoga for Geriatric Population" extensively discusses about Yogic view of aging and old age in ancient classics and epidemiology and discusses the geriatric population ratio at the global level. This document gives an insight about various physical health issues, such as arthritis, indigestion, constipation, etc., faced by old age people system-wise. It explains various psychological issues such as dementia, depression, alzheimer's disease, etc., which are more common in old age people. The manuscript discusses social and security issues in the geriatric population like loss of social roles & esteem, depleted social networks, self-neglect, etc. The publication also educates about the rehabilitation approaches in various conditions generally found in elderly people and deals with understanding the Yogic concept of diet, micro & macronutrients, and the nutritional well-being of an elderly person. Furthermore, the book convoluted the role of Yoga in geriatric health, the method of instruction of Yoga practices, Yoga protocol for the elderly population, and evidence-based research on the elderly population.

This book may serve the purpose of integrating the philosophy of Yoga with our daily practice of Yoga through a systematic but simple approach following WHO guidelines. This publication shall be a valuable contribution to the contemporary works on Yoga, acquiring global acceptance and validation. The language and explanations are simple and serve as an introduction for beginners who are looking to learn the unique practice of Yoga.

I hope the publication will be very useful for Yoga enthusiasts, particularly the geriatric population and the inquisitive minds searching for timeless truths in modern-day lifestyle.

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This endeavour would not have been possible without the guidance and support of the Ministry of Ayush, the Government of India, New Delhi. I sincerely thank *Vaidya Rajesh Kotecha*, Secretary, Ayush for his timeless motivation and guidance, and also Special Secretary, Joint Secretaries, and Senior officials of the Ministry of Ayush, Government of India, for their consistent guidance and support in all activities of WHO-CC.

I am overwhelmed by all humbleness and gratitude to acknowledge in-depth to *Dr. Arpan A Bhatt*, HoD & Professor, Department of Swasthavritta and Yoga, Institute of Teaching and Research in Ayurveda (INI), Ministry of Ayush, Government of India, Jamnagar, Gujarat for his insight and unparalleled support in the preparation of the "concept paper" of this book and also in preparing the "zero draft" and in disseminating this remarkable document on the topic "Yoga for Geriatric Population".

I am extremely grateful to the committee members for their invaluable contribution: *Dr. Kim Sung Chol, Late. Dr. Mukund Vinayak Bhole, Yogacharya Shri S. Sridharan, Ms. Suchitra Pareekh, Dr. Rajvi H. Mehta, Dr. Ulka Natu Gadam, Dr. C.G. Deshpande and Prof. R.S. Bhogal*. I would like to express my heartfelt thanks to the committee members, who, despite their busy schedules, played a decisive role in providing unceasing encouragement, assistance, and attention to making the project unique.

In this sequence, I would like to thank *Dr. D Elanchezhiyan*, Project Coordinator (WHO-CC), for his contribution in the preparation of the document. I would like to thank *Dr. Lakshmi Kandhan*, Assistant Professor (Yoga Therapy) for reviewing the document. I would also like to thank *Ms. Sairem Bandana Devi,* for her assistance in preparing this document.

I also extend my thanks to the entire teaching faculty of MDNIY, who were actively involved in various working groups and provided technical inputs for this WHO-CC activity especially, *Dr. Lakshmi Kandhan, Dr. Rameshwar Pal, Dr Kushbhu Jain*, *Ms. Sobika Rao and Ms Neetu Sharma*.

I would also like to thank *Mr. K. P. Easwar*, Language Expert, Yoga Demonstrators- *Ms. Lalita Mathur, Ms. Seema Sagar, Mr. Bal Mukund Singh, Mr. Mahender Bhadoria, and Mr. Tarun Sharma* for beautifully demonstrating the Yoga postures, and also to *Mr. Rohit Raikwar* (Graphic Designer), *Mr. Keshav, Mr. Nihal, and Mr. Nitin* for their contribution in the preparation of this document.

I would also like to thank the institute's officials, faculty & colleagues for their assistance throughout the project and all those individuals who have helped directly or indirectly in the publication of this book.

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01 INTRODUCTION TO AGEING

Ageing is a universal process and it affects every human being in the world, both physically and psychologically. It is a process that begins with conception, but in practice, ageing is regarded as that phase in life when body functioning begins to lose its adaptive response to stress, which leads to an increased risk of age-related diseases. It is a by-product of demographic transition[1], the change from high fertility to low mortality rates. The mental health of elderly people, especially the high incidence of geriatric depression, has become an issue of increasing concern with the rapid growth of the ageing population.

Old age is an unavoidable reality and is a community need. Ageing has different dimensions, such as social, behavioural, psychological, morphological, and molecular. Elderly people face several problems such as deteriorating physical health, financial issues, feeling of negligence, loss of importance in the family, and those related to the environment. These problems further add to the feelings of loneliness, being undesired or unwanted, being inadequate, and obsolescence of skill and education. Expertise in these aspects is interdependent and inductive in nature. Each one of these aspects may affect the quality and quantity of the problems in other categories.

The organic process of ageing is termed ***Senescence***[1] ; the medical study of this process is known as ***Gerontology***[2]; the study of diseases afflicting the elderly is referred to as ***Geriatrics***[3]. The chronological age denoted as 'old age' varies depending on the culture and history. Thus, old age is a 'social construct' rather than a definite 'biological stage'[4] (Salokangas and Joukamaa, 1991).

The term 'old age' normally refers to an appearance of frail, hunched, wrinkled, toothless with a dribbling mouth, and uncontrollable bladder and bowels. Therefore, a majority of old people would expect and desire an early death instead of extending the sustenance of life rather than living a prolonged, crippled, and dependent life. However, growing old is an inevitable part of the life cycle. The demographic trends indicate that a strong group of the population above 65 years of age is gradually building up, challenging the medical world and pressurising the governments by way of increased costs of health services (9 times more than young individuals) (Kinsella, K. G., & Phillips, D. R. 2005). As old people have a limited capacity to regenerate, their vulnerability to sickness and various anomalies is more as compared to that of young adults. It is a terminal phase of the human life cycle referring to an age nearing or surpassing the 'life expectancy'. Generally, old-aged persons are denoted by various terms as:

1. Old people (normal worldwide usage)
2. Seniors (America)
3. Senior citizens (Britain and America)
4. Older adults (used in social sciences)
5. Elderly people or elders (in many cultures, including aboriginals), etc.

1 Demographic transition is a phenomenon and theory which, refers to the historical shift from high birth rates and high infant death rates in societies with minimal technology, education (especially of women), and economic development, to low birth rates and low death rates in societies with advanced technology, education and economic development, as well as the stages between these two scenarios.
As defined by The Free Dictionary, Thefreedictionary.com. Accessed on 4 April 2016.
2 As defined by The Free Dictionary, Thefreedictionary.com. Accessed on 4 April 2016.
3 As defined by The Free Dictionary, Thefreedictionary.com. Accessed on 4 April 2016.
4 Old age as defined by Oxford Reference. Accessed on 4 April 2016.

Defining Old Age

The ageing process, though a biological reality with its dynamics far enlarged beyond human control, is also subject to the constructions by which each society senses old age. Chronological time plays a major role in its determination in the developed world. Usually, an age between 60 and 65 years is believed to be the starting of old age, which is more or less equivalent to the age of retirement in most developed countries. At the same time, chronological time has either little or no importance in the meaning of old age in many developing countries. There are some other more significant socially constructed meanings of age depending on the roles assigned to older people. In some cases, it is the loss of roles accompanying physical decline which is significant in defining old age. Thus, in contrast to the chronological milestones that mark the stages of life in the developed world, old age in many developing countries is seen to begin at the point when an active contribution is no longer possible (Gorman, 1999).

This classification of age varied between countries and in time spheres which reflected many instances of social class differences or functional capabilities related to the workforce; however, more often than not, the classification of age was a reflection of the prevailing political and economic situation. Often this definition is linked to the age of retirement, which, in some instances, was lower for women than men. This transition in livelihood became the basis for the definition of old age, which occurred between the ages of 45 and 55 years for women and between the ages of 55 and 75 years for men (Thane,1978).

The characteristics that distinguish old age are both physical and mental. Looking at the distinction in the marks of old age and middle age, legal scholar Richard Posner suggests that, as an individual transition into old age, he/she can be thought of as different persons 'time-sharing' the same identity (Posner, 1997). These marks may not occur at the same chronological age for everyone. Instead, they occur at different rates and orders for different people. Thus, marks of old age can easily vary between people of the same chronological age. One basic mark of old age that affects both body and mind is the 'slowness of behaviour' (Birren and Fisher, 1995). This 'slowing down principle' finds a correlation between advancing age and slowness of reaction and physical and mental task performance (Kausler and Kausler, 2001). At the moment, there is no standard numerical criterion defined by the United Nations (UN); but the UN agreed cut off 60+ years to refer to the older population.[5]

Old Age in Ancient Classics

The Sanskrit word for old age is *Jara*. The process of becoming old is known as *Jara,* derived from the root *Jri* –the act of wearing out or wasting. Vayu Purana personified it as *The Daughter of Death.*[6]

Ancient Vedic texts, Ayurveda, and Indian tradition have considered the life span to be of 100 or more years and have praised an active and healthy life as referred in *Rigveda, Yajurveda, Aitareya Brahmana, Ishavasyopanishad, Kathopanishad, Charaka Samhita, Sushruta Samhita, Ashtanga Samgraha, Ashtanga Hridaya,* etc. *Chhandogya Upanishad* consider a life span of 116 years and states that the duration of *Vriddha Avastha* or old age is of 48 years. Acharya Sushruta believes that *Vriddha Vaya* (old age) stretches to 30 years (71–100 years of age). However, the *Hani* or the degenerative phase, starts from the 41st year of life. It is also stated that during old age, a gradual decrement occurs in *Dhatu* (body tissues-components), *Virya* (potency), *Indriya* (sensory and motor apparatus), *Bala* (strength), and *Utsaha* (enthusiasm/zeal) occurs. Along with that, *Khalitya* (alopecia), *Valita* (wrinkling of the body), *Kasa* (cough),

5 www.who.int/healthinfo/survey/ageingdefnolder/en (last accessed on 6 February 2017).
6 www.sanskrit-lexicon.uni-koeln.de/scans/MWScan/2014/web/webtc/servepdf.php?page=0413-414 (last accessed on 24, September 2018)

Shvasa (breathlessness) etc., also occur. Acharaya Sharangadhara describes the gradual depreciation of various aspects of the body in different decades of life as given below (Dwiwedi *et al*..,1993).

Decadal period of life	
First decade of life	*Balya* (Childhood)
Second decade of life	*Vriddhi* (Growth)
Third decade of life	*Chhabi* (Beauty)
Fourth decade of life	*Medha* (Intellect)
Fifth decade of life	*Tvak* (Health of skin)
Sixth decade of life	*Drishti* (Vision)
Seventh decade of life	*Shukra* (Potency/libido)
Eighth decade of life	*Vikrama* (Gait/valour)
Ninth decade of life	*Buddhi* (Wisdom)
Tenth decade of life	*Karmendriya* (Activities – Motor apparatus)

The Yogic View of Ageing

The Yogic concept of ageing is unique. As per this concept, there is a life-and youth-sustaining nectar-like liquid oozing from the place of *Soma* (moon); it travels through the *Talu* (palate) and reaches the *Nabhi* (navel), and gets absorbed there. *Nabhi* is known as the place of *Surya* (sun). This fluid is known by many names, such as *Sara*, *Amrita*, and *Amaravaruni*. The constant downward flow and the absorption/ destruction of this fluid causes decay or degeneration of the body. The wastage of this fluid is regarded to be the cause of mortality in human beings (Digamberji and Jha, 2001).

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02 EPIDEMIOLOGY

There have been remarkable changes in the health status of the elderly population throughout the world over the past century, which have strongly impacted society as a whole. This growth in the number of elderly people, mostly due to an increase in the overall population figure, is also largely influenced by a decline in the leading causes of mortality. Such demographic changeovers reverberate in society, especially due to a rise in the need for medical care and dependency. This is expected to increase in the time to come (Lutz, Sanderson, and Scherbov [2008]; Park [2015]).

The epidemiological and demographical perspectives prompt policymakers and society to be prepared for generating proper avenues in the structure and function of the health care system as well as the provisions for social protection. It is apparent that such alarms were missed to be heard at the due time in the past; as a result, the health-care system for the elderly today has a challenge for society. An increase in chronic morbidity is not the only consequence of a large number of people reaching an advanced stage of old age. They will be more susceptible to various disorders as well. Decrement in functional abilities as well as social and psychological problems, affect the parameters of their well-being and quality of life.

Epidemiology has made further contributions to a better understanding of the health status and functional capabilities or insufficiencies of elderly people, thus trespassing the demographic focus of just calculating and projecting the number of elderly in society (Lutz, Sanderson, and Scherbov [2008]). Geriatric epidemiology approaches these challenges by studying the health, functional status, and quality of life of representative populations of individuals, ideally throughout the entire life span. The results of these population-based studies have often generated interventions aimed at improving the lives of millions of older individuals (Luigi Ferucci, 2008).

Epidemiology

The World Health Organization (WHO) says ***Population ageing is a triumph of humanity but also a challenge to 'society'*** (WHO, 2002). Worldwide, the number of persons over 60 years is growing faster than any other age group. The number of this age group was estimated at 688 million in 2006, projected to grow to almost 2 billion by 2050 (WHO, 2018). By that time, the population of older people will be much larger than that of children under the age of 14 years for the first time in human history. Moreover, the oldest segment of population, aged 80 and above is prone to falls and their consequences. This 80-plus segment is expected to represent 20% of the older population by 2050.

It is noteworthy that the world is on the verge of a demographic milestone. Young children have always outnumbered the number of elderly (aged 65 or older) since the beginning of the recorded history but now the condition is going to be just the opposite, where the elderly population will outnumber children under the age of 5 years. Owing to a decrease in the fertility rate and remarkably increasing life expectancy, the ageing of the population is going to continue and will also accelerate (Figure1).

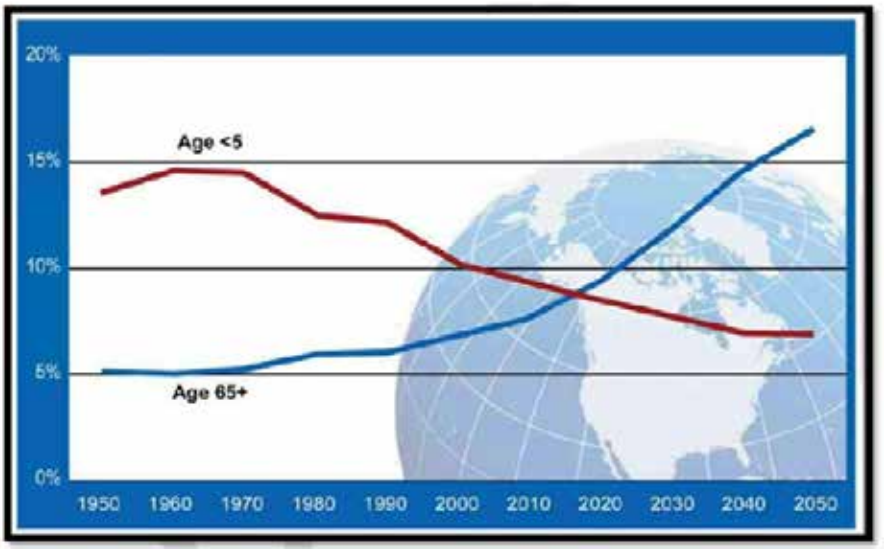

Figure1. Young children and older people as a percentage of the global population: 1950–2050
Source: United Nations. *World Population Prospects: The 2010 Revision.* (Available at: http://esa.un.org/unpd/wpp.)

The number of people aged 65 or older is projected to grow from an estimated 524 million in 2010 to nearly 1.5 billion in 2050, with most of the increase in developing countries. Thus, developed countries have the most older people, and less developed countries have the most rapidly ageing population (United Nations, 2004).

Most developed nations have had decades to adjust to their changing age structures. It took more than 100 years for the French population aged 65 or older to rise from 7% to 14%. In contrast, many less developed countries are experiencing a rapid increase in the number and percentage of older people, often within a single generation (Figure 2).

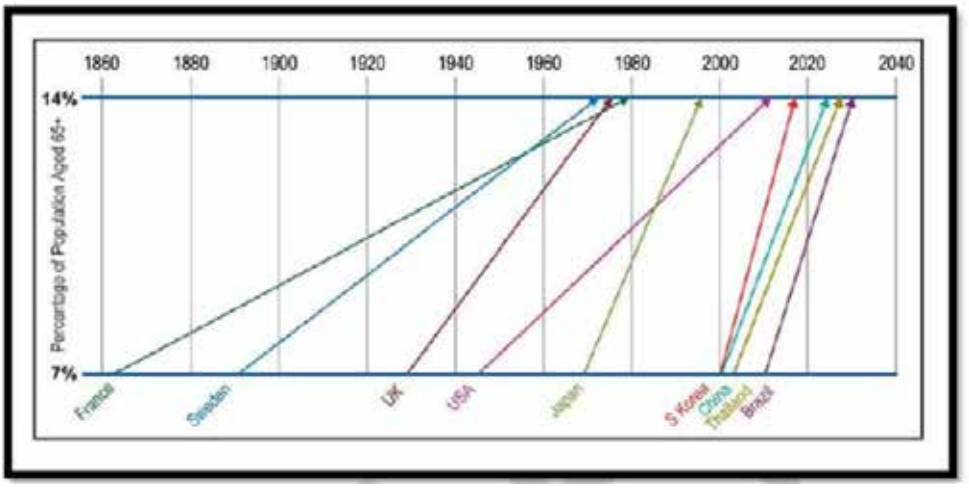

Figure 2.The speed of population ageing time required or expected for the percentage of population aged 65 and above to rise from 7% to 14%
Source: Kinsella K, He W. 2009. An Aging World: 2008. Washington, DC: National Institute on Aging and U.S. Census Bureau

Thus, it is quite evident that the developing countries will need to quickly adjust and adapt to this new reality; and lesser developed nations must focus on framing fresh policies for agencies that provide financial securities and for those agencies that provide health and social care needed by the elderly population. The geriatric population also will suffer from the lack of extended period, of economic growth as experienced by the ageing societies of the West, i.e., some countries would grow old before they become rich. In some countries, the number of people entering older age will pose a challenge of different dimensions in terms of building national infrastructure as a whole and the health-care system in particular.

Figure 3 captures this numeric surge in older people in the world's two most populous countries: China and India.

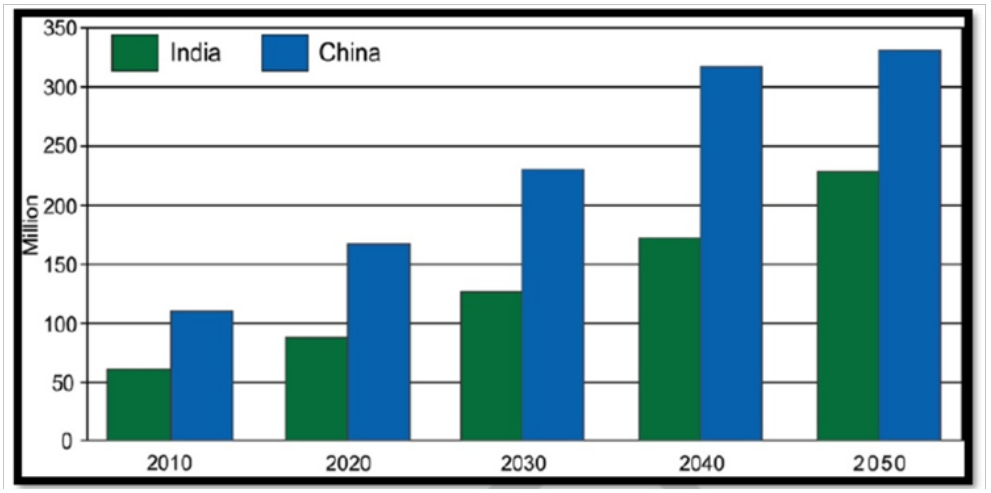

Figure 3. Growth of the population aged 65 and older in India and China: 2010–2050

Source: Kinsella K, He W. 2009. An Aging World: 2008. Washington, DC: National Institute on Aging and U.S. Census Bureau

China's older population (over age 65) will likely swell to 330 million by 2050 from 110 million in 2010. India's older population of 60 million in 2010 is projected to exceed 227 million in 2050, an increase of nearly 280% (WHO, 2010).

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03 PHYSICAL ISSUES RELATED TO GERIATRIC POPULATION

As the body starts growing old, a gradual decay in the body tissues and other aspects sets in. This is usually due to a decrease in the capacity for regeneration and lower nutritional levels. The body of elderly people begins to show various signs and symptoms pertaining to various systems of the body. Although it is not necessary that all elderly people show the same signs and symptoms that are identical to each other, the majority of them show some or a number of signs and symptoms. Some of them are described below.

1. Musculoskeletal system

Conditions afflicting the musculoskeletal system are especially frequent in elderly people. Identification of potential rheumatic consequences of inter-current medical conditions and the treatment of musculoskeletal diseases of geriatric patients require special attention (Kasper *et al.*., 2016). A few specific medical issues afflicting the musculoskeletal system in elderly persons are listed below.

a. **Bone and joint:** As the age grows, the bones tend to become thin and shrink in size, which may be reflected in the loss of height, changes in posture in many people, stooping, and increased susceptibility towards diseases related to bones and joints such as osteoarthritis and osteoporosis.[1]

b. **Mobility impairment or loss:** Owing to mal-alignment of the bones and joints and a decrease in the tone and power of the muscles, 14% of elderly people between the age of 65 and 74 and 50% of those over 85 years of age are seen to be affected by impaired mobility.[2] This condition not only affects the physical body of elderly people but has serious psychological and social consequences as well (Gary McCleane, *et al.*., 2006).

c. **Pain:** With the increase in age, pain is a symptom that afflicts old people around 25% of the time and reaches up to 80% of those who are either hospitalized or in nursing homes (Kasper *et al.*., 2016). In most cases, such pains are either rheumatological or malignant (K. Park, 2015).

d. A wide range of articular and non-articular diseases–fibrositis, myositis, osteoarthritis, rheumatoid arthritis, gout, and spondylitis of the spine – affect elderly persons (Pistelli *et al.*, 2003).

2. Respiratory system

The respiratory system also undergoes degenerative changes with increasing age. Some changes from which the lung suffers in the old age areas are listed below (Heart Health, 2011).

a. Decrease in peak airflow and gas exchange

b. Decrease in lung functions like vital capacity

c. Weakening of the respiratory muscles

d. Decrease in the potency of lung defence mechanisms

e. Chronic mucus hyper-secretion (CMH) (US Health Services, 2011)

1 The Normal Aging Process. Accessed at www.documbase.com on 4 April 2016.
2 Accessed at www.wikipedia.org/wiki/Old-ageon 4 April 2016.

3. Circulatory system

Like other systems, the organs of the circulatory system are also affected by old age. The problems may be enlisted as under: (Shamburek *et al.*., 1990, Heart Health, 2011).

a. Angina
b. Arrhythmia
c. Anaemia
d. Arteriosclerosis
e. Congestive cardiac failure
f. Coronary artery diseases
g. High blood pressure and orthostatic hypotension
h. Aortic stenosis
i. Transient ischemic attack
j. Deep vein thrombosis
k. Varicose veins
l. Aneurysms
m. Peripheral vascular diseases
n. Heart ailments (Tanvir *et al.*., 2010).

4. Digestive system

About 40% of the time, digestive disorders marks an old age. These include the ones listed below. (Grassi, M *et al.*., 2011)

a. Decreased ability to eat enough
b. Decreased capability to absorb nutrients
c. Constipation
d. Bleeding
e. Diverticulosis
f. Gastro-oesophageal reflux diseases (GERD)
g. Polyps
h. Peptic ulcer diseases
i. Atrophic gastritis
j. Lactose intolerance
k. Seniors who have diabetes would have digestive disorders like gastroparesis.
l. An elderly buccal cavity may have a reduced proportion of saliva, along with decreased oral hygiene, it may increase the chances of tooth infection and decay in old age.

5. Nervous system

a) **Gait change:** Owing to senile changes in the musculo-skeletal and nervous systems, the gait of the elderly changes with increasing age. The velocity slows, the double stance time increases, and, at times, it also appears like a person is walking on ice (JamesO, 2016).

b) **Essential tremor:** Owing to weakening neurological conditions and support from muscles and tendons, an elderly person suffers from tremors in a part of the upper body. This condition worsens with growing age. Due to this, the performance of daily routine, particularly fine work, is adversely affected (Sullivan, K. L.2004).

c) **Falls:** In old age, due to varied reasons, balancing the body in various activities becomes a problem leading to falls. This increases the risk of injuries from falls in elderly people. This becomes a leading cause of morbidity and mortality for elderly people (Finlayson ML, 2010).

6. Uro-genital system

a. Incontinence of urine is one of the most common problems in old age (Ouslander, J.G., 1981).

b. Benign prostatic hyperplasia (BPH). (Ballentine Carter H, 1990).

c. Andropause or semenopause, where a male struggles to perform sexual activities (Matsumoto M, 2002).

d. Menopause, where females undergo a lot of changes leading to such symptoms as hot flushes, mood swings and excessive or less or painful menstrual bleeding (Monteleone P, et al.., 2018).

e. The sexual drive in both sexes decreases after the active fertile period is over (Todd B. Nippoldt, 2015). At the same time, the growing body of research on sexual behaviours and desires of the elderly does not fully agree with the 'asexual' image of older people. The fact that people in the age group of 75–102 years continue to experience sensuality and sexual pleasure gives credence to the growing research on this topic (BretschneiderJ.G. 1988). Besides this, the sexual behaviour of the elderly includes sexual thoughts, fantasies and erotic dreams, masturbation, oral sex, vaginal and anal intercourse, etc., (DeLamater. J, 2012).

7. Endocrine system

The ageing process leads to a gradual decline in the functions of endocrine glands that secrete various hormones. Malfunctioning of endocrine glands affects the secretion of respective hormones, which can cause various ailments such as the ones listed below (Chahal, H.S, 2007, Karasek, M. (2004).

a. Melatonin: Sleeplessness, etc.

b. Dopamine: Tremors, etc.

c. Insulin: Diabetes mellitus

d. Sex hormones: Andropause and menopause

e. Suprarenal gland-related hormones: Weak immune responses, etc.

8. Immune system:

Senescence affects the immune system leading to several disorders. (Fuentes E et.al., 2018, Akha A A,. 2017)

a. Diminished immune response

b. Increased risk of autoimmune disorders

c. Slower healing process

d. Increased risk of cancers, etc.

9. Skin-related issues

Skin is an important physical marker of old age. Various senile changes occurring in the integumentary system, as listed below, may be observed (Chang CH et.al, 2017., Vary JC Jr, 1999).

a. Loss of skin elasticity
b. Dryness of the skin
c. Wrinkled skin
d. Thinning of hair
e. Balding
f. Greying of hair

10. Special senses and other functions

The elderly population is also affected by diminishing functions of the special senses. This may be summed up as given below.

a. Vision: Presbyopia hinders reading abilities in low light and small print, which usually occurs by the age of 50 years. Impairment in the reading speed and ability to locate objects may be observed (Sheeladevi S, et al.. 2019). Cataract is another common visual problem in the elderly (Krishnaiah S, 2018).

b. Hearing: Old age adversely affects the sense of hearing by the age of 75 and above; 48% of males and 37% of females encounter impaired hearing (Davis A et al.., 2016). This condition of partial hearing loss is predominantly seen to damage communication between the elderly and young people (Reiss M, 2002).

c. Gustation: The functioning of taste buds diminishes, marking the onset of senility. This, in turn, impairs the taste of food, food intake as a whole, and reception of proper nutrition (Sergi G et.al, 2017).

d. Thirst perception: The perception of thirst also decreases in elderly people, and it has been observed that above the age of 85, 41% of the elderly drink insufficiently (Volkert D et.al, 2005).

e. Voice: As the vocal cords become weak and vibrate more slowly, the voice in old age tends to become weak (Çiyiltepe M, 2017).

f. Sleep: A sound sleep at night does not usually happen in old age in more than 55% of cases, which may result in day-time sleepiness. Almost 88% people reported sleep-related complaints with a mean age of 74 in a study of 9000 persons (McCall, W. V. 2004).

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04 PSYCHOLOGICAL ISSUES RELATED TO GERIATRIC POPULATION

While defining health, WHO has laid an emphasis on psychological well-being also. As a person crosses the limit of youthful years, the mind and body undergo certain changes, which may be the starting point for the psychological issues of old age. Mental disorders afflict about 15% of people aged 60+ according to WHO estimates (WHO, 2016). Another survey carried out in 15 countries reported that mental disorders of adults interfered with their daily activities more than physical problems (Allyn & Bacon, 2010). These may be summarised as under.

Reduced mental and cognitive ability: (Timothy A, 2009). The overall degenerative phenomenon induces reduction in the mental and cognitive abilities of seniors, leading to various problems; some of which are listed below.

1. **Dementia:** Dementia is a general term used to denote memory loss and other intellectual abilities that are serious enough to interfere with the daily life of a person. Its prevalence increases in old age from about 10% at an the age of 65 years to about 50% over the age of 85 (Jacoby S, 2011). It is estimated that 47.5 million people worldwide are living with dementia (Chertkow H, 2018). There is a decrease in the speed of encoding storage, and retrieval of the received information in old age due to memory loss. Further, people with dementia take more time to learn new information (Carrol JA, 2018).
2. **Alzheimer's disease:** Alzheimer's disease accounts for almost 50%–80% of dementia cases. A demented behaviour can include wandering, physical aggression, verbal outbursts, depression, and psychosis (Ganapathi HB, 2017).
3. **Depressed mood:** (Kennedy G.J, 1996)According to Cox*et al.*.(2012), old age is a risk factor for depression caused by prejudice (i.e., 'deprejudice'). When people are prejudiced against the elderly and then become old themselves, their anti-elderly prejudice turns inward, causing depression. People with more negative age stereotypes will likely have higher rate of depression as they get older. (K. Park, 2015). The suicide rate is highest due to depression among the 65-plus population (Avasthi A, 2018).
4. **Anxiety:** Anxiety disorders including, phobias, social anxiety, etc., are psychological issues centred on the feeling of fear and may sometimes include panic attacks. They are often triggered in elderly people because of life changes (Tajikabad M, et. al, 2017).
5. **Substance abuse:** As ageing comes with many physical and psychological changes, people may find it difficult to cope with them. This may lead them to turn to various substance abuse rather than seeking support from the immediate society. Life changes, stress, depression, and anxiety may trigger this attitude further (Diniz A et. al, 2017).
6. **Incompetence:** The fragility of the body and impairment in adventures or fine work renders an elderly person to be dependant, and this induces the feeling of incompetence and worthlessness (Laura E, 2010).
7. **Caution:** As an elderly starts knowing the decreased functionality, ability, and capacity to perform different tasks, a natural sense of extra caution creeps in. This is further supported by the thought that old people have less to gain and more to lose by taking undue risks in comparison to young people (Richard A, 1995).

8. **Fear of crime:** The fear of crime is sometimes a bigger concern than finances or health, especially among frail elderly people. This fear becomes a major reason for them to restrict their activities despite the fact that younger people become victims of crime more often than old people (Laura E, 2010).

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05 SOCIAL AND SECURITY ISSUES IN GERIATRIC POPULATION

Owing to increasing psychophysical limitations, older people have many disorders and disabilities as compared to younger ones. In particular, problems related to social life security and its influence on the life, risk, and experience of illness are seen more in elderly people (Kaplan DB, 2015).

Such social issues may be categorised under different captions as listed below (Smith-Ruiz D. 1985, Dury R, 2014).

a. Loss of social roles
b. Loss of esteem
c. Limited economic resources
d. Depleted social networks
e. Self-neglect
f. Devaluation

Loss of Social Roles

During an active life in younger days, every person shoulders various responsibilities and acts in different roles in various capacities. This helps in building the importance and esteem of a person keeping him/her worthy and fit. However, this worthiness and fitness come at the cost of his/her leisure time. With the gradual onset of senescence, a person has slowly drifted away from such responsibilities, designations, and importance. Though the elderly people seem to become more respected and more designated but in reality, their actual active input decreases; this would make them feel that their social roles are gradually decreasing.

Loss of Esteem

Esteem is built with the confidence a person gains because of one's capabilities and sequential successes in various sectors of life. As one moves towards senility, the physical and mental capabilities start diminishing, and a person may not succeed in his/her actions as frequently as he or she is used to during younger days. This condition shakes the roots of confidence leading to loss of esteem.

Limited Economic Resources

When people are young, they work for their livelihoods and are easily able to meet financial requirements. As they advance in age and retire from their active life, their physical strength decreases, as also the capacity to work. This situation eventually leads to a decrease in financial earnings, affecting their psychological and social status.

Depleted Social Networks

Old age not only induces physical and psychological limitations but also restricts the capacity of a person to socialise and even to communicate, at times. The fragility of the body and the extra sense of caution limit elderly people to from carrying out frequent journeys also. This results in the depletion of their social networks.

Self-neglect

Self-neglect means not caring for one's own self. It can include ignoring personal hygiene, not paying bills, not maintaining the integrity or cleanliness of the home, not obtaining or preparing food (leading to under nutrition), not seeking medical care for potentially serious symptoms, not filling medical prescriptions or taking drugs, and skipping follow-up visits.

Devaluation

The value of a person depends on the capabilities and contributions that the person makes in the physical, psychological, financial, emotional, and social spheres of life. A young person is more capable in all those fields, and it remains so till the age of retirement from active life, work, etc. When a person starts feeling that his/her value has decreased, the society and family also (at times) neglect such a person who has lost their job, designation, power, etc. Once the leading persona of the family ceases to be so, and the place is taken over by someone else, a feeling of devaluation dawns in the minds of such people.

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06 REHABILITATION AND GERIATRIC POPULATION

In general terms, rehabilitation may be defined as *the reduction of functional deficits without necessarily reversing the underlying biology of the disease* (Tallis R., 1992). The scope of rehabilitation is wide, and it includes acute and chronic cases. This definition embodies various aspects, including the following:

a. Impairment(specific deficit)
b. Activity limitation
c. The resultant limitations in the functional capacity due to impairment
d. Participation restrictions affecting the quality of life
e. Damaged system and its impact
f. Damaged system and its impact on other body systems
g. Psychological attitude
h. Immediate material environment (e.g., clothes)
i. The near environment (e.g., housing, equipment)
j. Distant environment (e.g., shops, social outlets)

Therefore, comprehensive rehabilitation tends to include all of the above and more. Such a rehabilitation process calls for interventions at all levels (listed above) and can only be carried out only through the involvement of multiple professionals such as a physician, rehabilitation nurse/caregiver, physical therapist, occupational therapist, psychologist, medical social worker, and recreational therapist (Weber, D. C.,1995). The same principles can be extrapolated to a wider group of conditions and are usually similar for different age groups. Besides, older patients, owing to their multiple needs and background frailty, may require lengthier and more complex processes as compared to similarly impaired younger people.

Stages of rehabilitative process

The rehabilitative process includes the following stages (Stuck AE, 1993):

a. Assessment: identification and analysis of the problems
b. Planning: analysis of the problem(s) and setting of goals
c. Treatment: determination of the modes of intervention to reduce disability
d. Evaluation/reassessment: checking the effectiveness of selected interventions and review
e. Care: interventions to alleviate consequences of disability
f. Advice: coping strategies for patients and caregivers

Usually, three areas are covered in geriatric rehabilitation: (1) normal ageing due to disease and de-conditioning; (2) cardiovascular problems such as vascular disease and stroke; and (3) skeletal problems, including osteoarthritic condition and osteoporosis. With increasing age, patients often suffer

from multifaceted physical, psychological, and emotional changes, which affect their levels of activities, function, and well-being. Rehabilitation helps elderly people to maintain their functional independence. Rehabilitation is essential in geriatric people, not only to maintain their own well-being but also for the society as it is related to socio-economic stability and development.

Communication is equally essential to geriatric rehabilitation, especially for improving any sensory impairment, including those related to vision and hearing. A patient's health and longevity can be improved by preventing the incidents of falls and conditions like osteoporosis. Taking care of proper nutrition can avoid malnutrition and would promote healing along with vitalizing a patient to participate in a formal rehabilitation programme. Depression is commonly observed in elderly people due to loss of mobility and inability to perform activities of day-to-day life. The goals and outcomes of rehabilitation are adversely affected due to cognitive impairments such as delirium and dementia (Starr, L. 2013). One of the main components of geriatric rehabilitation is proprioceptive training, which will help in the prevention of falls and would promote maximum functional independence (Suetterlin, K. J. (2014).

In intermediate care, where there is a requirement to provide hospital-based short-term intensive physical therapy, geriatric rehabilitation plays an important role. This kind of treatment may be for recovery of muscular skeletal function, specifically a recovery from joint, tendon or ligament repair and/or physical medicine and rehabilitation care when an elderly person get unsynchronized with their medications which results in deteriorating personal health or that which reduces their ability of independent survival (Starr, L. 2013). A few geriatric rehabilitation approaches in various conditions generally found in elderly people may be charted as follow.

a. **Geriatric musculoskeletal/orthopaedic rehabilitation:** Orthopaedic rehabilitation is most commonly required in elders due to painful conditions associated with musculoskeletal injuries and dysfunctions. Some researchers have proved that walking, stair climbing, high-intensity resistance training, low-intensity resistance training; aerobic exercise, etc., can be useful rehabilitative approaches (Taaffe, D. R. 2000). Besides, these are helpful in the management of musculoskeletal pains in geriatric people. The utilisation of physical therapy, thermal agents, manual therapy, protective and supportive devices, Transcutaneous Electric Nerve Stimulation (TENS), cognitive behavioural therapy, mind–body therapy, warming-up exercise, cooling-down exercise, strengthening exercise, aerobic exercise, stretching exercise, flexibility exercise, etc., would prove to be good rehabilitative approaches (Subhedar, R. 2014).

b. **Geriatric cardiac rehabilitation:** It was earlier believed that geriatric patients with cardiac problems should not be subjected to exercises, but some researchers have proved that a gradual onset of exercises such as aerobics, resistive training, and inspiratory muscles training, are actually helpful for geriatric cardiac rehabilitation (Baldasseroni, S, 2016).

c. **Geriatric Pulmonary rehabilitation:** Physical therapy in such condition may include walking, aerobic exercise, stationary bicycling, stretching of muscles, etc., depending on the tolerance of the patients and required specialist interventions as and when necessary (Couser Jr, J.L, 1995).

d. **Geriatric Psychiatric rehabilitation:** Old age induces many kinds of physical and functional limitations and changes in psychological and emotional conditioning. The near and distant environment, social adaptability and conditioning, etc., further add to the existing problem. As a whole, all these render an elderly person to have abnormal psychological conditioning. Geriatric psychiatric rehabilitation is required for elders suffering from chronic psychological problems. Such rehabilitation includes training interventions such as social skills training programme, combined skills training programme, health management training programme, functional adaptation skills training (FAST), cognitive behavioural social skills training (CBSST), and vocational rehabilitation (Pratt, S. I, 2008).

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07 DIET AND NUTRITION FOR GERIATRIC POPULATION

Ageing induces various changes in the physio-psycho-social conditioning of a person. Such changes lead to a decreased sense of taste and smell, reduced appetite, loss of vision and hearing, impaired oral health, etc. The ramifications of ageing are many, but a few are listed below.

- The altered needs for energy may render the usual normal diet to be lacking in essential nutrients.
- Decreased physical activity may result in the progressive depletion of body weight and loss of appetite.
- Muscle loss (Sarcopenia) may give rise to decreased functional ability, which would require external assistance to carry out day-to-day activities.
- Psycho-social conditioning of an aged person may get disturbed. For example, the isolation/death of the partner would become one of the causes of decreased appetite.
- Altered environmental conditions such as financial position and change of residence may result in limited access to food or qualitatively and quantitatively poor diet.

The cumulative effect of these factors would be progressive undernutrition (Visvanathan R, 2002. Chapman I M, 2004., MacIntosh C, *et al.*. 2006). Impaired nutrition can further leads to depleted immune response, decreased muscle strength, increased fatigue, inactivity, disturbed temperature regulation, impaired healing, improper regulation of fluids, electrolytes, and unusual psycho-social behaviour (Milne A C *et al*., 2009,. Elia M *et al*.., 2009)

In elderly people, dietary factors play a vital role in causing various diseases. Some of the dietary discrepancies may be persisting since the younger days also. It seems that dietary fats may be associated with the production of cancer of prostate, colon, and pancreas. Elevated blood pressure, blood lipids, glucose intolerance, etc., known as atherogenic risk factors, are considerably affected by dietary factors and may result in coronary heart diseases in elderly people. Degenerative disorders, such as cardiovascular, cerebrovascular, and metabolic disorders, etc., are due to improper diet. It has been observed that micronutrients play an important role in promoting health and preventing the incidence of non-communicable diseases; deficiency of micronutrients is commonly found in older people (WHO, 2002).

In a study carried out by researchers from 12 countries on 4507 people (75.2% female) with a mean age of 82.3 years, the prevalence of malnutrition in elderly people was evaluated using the mini nutritional assessment (MNA). The study found that in four different types of settings – though the number varied with considerable differences – the prevalence of malnutrition in the group of people under rehabilitation was 50.5%, those in hospitals it was 38.7%, in nursing home it was 13.8%, and in community it was 5.8%. The overall prevalence of malnutrition was 22.8%. The 'at risk' group had a prevalence of 46.2%. Thus, approximately two-thirds of the participants were either at nutritional risk or malnourished (Kaiser M.J. et.al 2010). The available data further suggest that one in four older adults is malnourished and two in four adults are at nutritional risk (Kaiser M.J. et. al, 2009). An unintentional weight loss in the elderly could adversely affect physical abilities and can be associated with increased health risks. (Visvanathan, 2009,.Ritchie, C. S, 2008).

Nutritional well-being of elderly person

Nutritional well-being is directly related to the physical, psychological, emotional, spiritual, and social status of an elderly person. It also positively influences independence, living arrangements, and diseases

management of the elderly. Good relationships with the members of the family as well as interpersonal relationships with caregivers and the community as a whole would go a long way in ensuring a better quality of life for an elderly person (Niedert, K. C. 2005).

To achieve the goal of nutritional well-being, the diet of the elderly has to be rich in certain macronutrients and micronutrients as listed below.

1. Macronutrients

a. Protein: Protein is the main building block of the human body. In old age, as the regenerative capacities decrease and the degenerative processes increase, it is important to maintain the protein level in the diet. Studies have proved that elderly people with high protein intake are able to retain lean muscle mass, a high-protein diet also works as an important measure to prevent falls. If the lean muscle mass decreases and the proportion of fat mass increases, there are chances of an increase in metabolic imbalances and related chronic conditions. Hence, a high protein diet would decrease the incidence of metabolic disorders in elderly people. It was also found that high protein intake is associated with lower bone loss, which would be beneficial in preventing orthopaedic problems (Hosten DK et. al, 2008. Hannan M T et. al, 2000).

b. Fat: An elderly adult who is fit and within the range of normal body weight should minimize the intake of saturated fats to improve heart health. If a person is frail with a body weight lower than the healthy limit or with less appetite may require a diet that is rich in fat so as to increase the calorie input and aid weight gain (Chernoff, R., 2001).

c. Omega 3 fatty acids: The diet of elderly people should be rich in omega 3 fatty acids, which are easily found in flax seeds and flax seed oil, walnuts, canola oil, and some types of fish. These fatty acids are believed to decrease inflammation, cardiovascular events (arrhythmias, recurrent myocardial infarctions, cardiac deaths, etc.), diabetes, and cognitive decline (Eveleth, P. B et.al, 1998. Pray, Leslie, et al.,2010).

d. Fibres: Constipation and other problems related to bowel movements are commonly seen in elderly people. This may be attributed to various factors such as decreased muscle tone, diminished neural impulses, lack of a fibre-rich diet and less physical activity. A diet rich in fibre will minimise bowel issues and irritation as well as ensure the health and functioning of the digestive system. The fibre-rich sources of diet include wholegrain cereal, porridge, wholegrain bread, brown pasta and brown rice, fresh fruit and vegetables, and pulses (Chernoff, R., 2001).

2. Micronutrients

Table 1 provides dietary recommendations for various micronutrients for the elderly.

Table 1. Dietary Recommendations for Various Micronutrients
(Montgomery, Stephanie C., et al.. 2014).

Micronutrient	Men		Women	
	Age 51–70 years	Age >70 years	Age 51–70 years	Age >70 years
Vitamin A, µg/d, RDA	900	900	700	700
Vitamin C, mg/d, RDA	90	90	75	75
Vitamin D, µg/d, AI	15	20	15	20
Vitamin E, mg/d, RDA	15	15	15	15
Vitamin K, µg/d,AI	120	120	90	90

Thiamin, mg/d, RDA	1.2	1.2	1.1	1.1
Riboflavin, mg/d, RDA	1.3	1.3	1.1	1.1
Niacin, mg/d, RDA	16	16	14	14
Vitamin B6, mg/d, RDA	1.7	1.7	1.5	1.5
Folate, µg/d, RDA	400	400	400	400
Vitamin B12, µg/d, RDA	2.4	2.4	2.4	2.4
Magnesium, mg/d, RDA	420	420	320	320
Zinc, mg/d, RDA	11	11	8	8
Iron, mg/d, RDA	8	8	8	8
Calcium, mg/d, AI	1200	1200	1200	1200

A. Vitamins

a. **Vitamin A:** Studies have shown that Vitamin A deficiency is not a common phenomenon as only about 3.9% of elderly people are found with inadequate serum retinol concentrations (Carmem-Costa-do-Nascimento, Christiane, et al.. 2011). Elderly people who are deficient in Vitamin A may show higher risk of cancer and heart diseases, specifically deaths related to cardiovascular diseases (Brazionis L et. al, 2012). Sufficient Vitamin A intake would reduce the risk of hearing loss (Gopinath B et.al, 2011). Vitamin A is believed to decrease the risk of prostate cancer or be helpful in the early detection of it. Further, clinically Vitamin A has shown to slow down the progression of dementia and Alzheimer's disease. Proper intake of Vitamin A also boosts the function of the immune system (Mondul A M et.al, 2011., Beydoun H A et.al, 2011., Ono K et. al, 2012., Wardwell T J et. al, 2008).

   Dietary sources: Animal and plant foods such as green leafy vegetables, carrots, squash and eggs and beef liver. Root vegetables and tubers are rich sources of Vitamin A.

b. **Vitamin B_1:** As per a clinical study, thiamine supplements to the elderly population have improved the quality of life decreased systolic blood pressure, induced some weight loss, improved sleep, and increased energy (Wilkinson T J et. al, 1997).

   Dietary sources: Vitamin B_1 is found in legumes, whole grains, almonds, Bengal gram dhal, groundnut, gingelly seeds, liver of sheep, cauliflower, kale, yeast, eggs, etc., (Park K, 2015, Doets, Esmee L., et al.., 2013).

c. **Vitamin B_{12}/Cobalamin:** The deficiency of Vitamin B_{12} would result in megaloblastic anaemia and/or demyelinating neurologic disease, altered mentation, depression, and psychosis. Some studies have reported that there is a significant association of Vitamin B_{12} deficiency with the risk of dementia or global cognitive decline. O'Leary F et.al,2012., Gorrschlich M M, 2007).

   Dietary sources: The only reliable source of this vitamin is animal products such as milk. Microorganisms are the ultimate source of all naturally occurring B_{12} (Olsen A et.al, 2009). In European countries and the United States, meat is the most important contributor. Other dietary sources of Vitamin B_{12} is fortified cereals, fish, poultry, and eggs. Strict vegetarians are at a higher risk of developing this deficiency as compared to others (Tabacchi G et.al, 2009).

d. **Folic acid:** The main symptoms of folic acid deficiency are megaloblastic anaemia and diarrhoea. This deficiency further induces the risk of osteoporosis, and decreased physical functions, particularly balance and gait, as well as the risk for stroke and cardiovascular diseases (Solomon, L. R. 2013, Ngtp et.al, 2012).

Dietary sources: Dark leafy vegetables, fruits, nuts, beans, peas, dairy products, eggs, sea food, poultry, and meat (Yang H T et.al, 2012., Park K,2015).

e. **Vitamin C (Ascorbic acid and Dehydro ascorbic acid):** Deficiency of Vitamin C may cause fatigue, muscle pain, and increased susceptibility to infection. Vitamin C is required for the proper functioning of the hepatic mixed-function oxidase system and for intestinal absorption of iron. This vitamin serves as an antioxidant and it reacts with superoxide and hydroxyl radicals in an aqueous environment. Vitamin C also plays a role in the biosynthesis of collagen, bile acids, carmitine and as a transmitter of epinephrine. Many disorders pertaining to the deficiency of this vitamin are observed in the elderly population. The classical syndrome generated by the deficiency of Vitamin C is known as scurvy, characterised by disorders in connective tissues leading to petechial haemorrhagic inflamed and bleeding gums, joint effusions, anaemia, improper wound healing, and at times even death.[xxx] Vitamin C is also required for better physical performance (Saito K et.al, 2012).

Dietary Sources: Fruits and vegetables such as citrus fruit, broccoli, strawberry, green peppers, cantaloupe, and tomato (WHO, 2004). Amla or Indian gooseberry is the richest source of Vitamin C both in fresh and dry conditions. Guava is another cheap and rich source of this vitamin (Park K,2015).

f. **Ergocalciferol (Vitamin D_2) and Cholecalciferol (Vitamin D_3):** Vitamin D is basically required for maintaining the levels of calcium and phosphors supporting the cellular processes. Recent findings have observed that it participates in the growth and differentiation of hematopoietic and immune cell lines (Montgomery, Stephanie C., et al..2014). Worldwide, the deficiency of Vitamin D is commonly seen in the aged and institutionalised elderly people (Hilger J et.al, 2014). Dark-skinned older adults and those having less exposure to the sun also suffer from its deficiency (Institute of Medicine, US, 1997). It has also been observed that deficiency of Vitamin D in elderly people reduces their mobility, increases the risk of falls and fractures, as well as deaths by cardiovascular means (Boucher B.J, 2012). Normal levels of Vitamin D reduce the risk of cancer, infections, and metabolic diseases (Qin W et.al, 2013, Bouillon R et.al, 2013). Elders deficient in vitamin D have poorer cognitive function, and it is also associated with depression (Gschwind Y.J et.al, 2014, Lapid M I et.al 2013).

Dietary sources: There are limited dietary sources containing natural Vitamin D. Sunlight happens to be its major source. Some animal products – particularly milk or fortified milk and fatty fishes like Salmon, Tuna, and Mackerel – contain natural Vitamin D (Moore C E et.al, 2014). Liver, egg yolk, some species of fish, and fish liver oil are other sources that provide Vitamin D (Park K, 2015).

g. **Vitamin E (Tocopherol and Tocotrienol):** Vitamin E comprises eight compounds: four tocopherols (α, β,γ, and δ) and four tocotrienols (α, β,γ, and δ). The most active form is α-tocopherol, which removes free radicals in the lipophilic environment, specifically in the cell membrane and helps to maintain their integrity (Devore E E et.al, 2010).The deficiency of Vitamin E results in the fragility of red blood cells, which leads to haemolytic anaemia the deficiency also results in the degeneration of nerve cells, which leads to peripheral neuropathies, destruction of posterior columns of the spinal cord, and ophthalmoplegia. The antioxidant properties of this vitamin are being studied, and some studies have shown that proper level of vitamin E reduces the risk of dementia (AlaviNaeini A M et.al). If proper intake of Vitamin C, Vitamin E, and carotenes are done, the risk of global cognitive decline decreases in elderly people (Rafnsson S B et.al, 2013).Intake of Vitamin E above the recommended level may enhance the T cell function in aged animals and humans (Pae M et.al, 2012). It has also been observed that life expectancy increased by six months among those who were supplemented by Vitamin E (Hemila H et.al, 2011). Antioxidant vitamins like Vitamin E and Vitamin C are good for eye

health, slowing the progression of age-related cataract and delaying macular degeneration (Mathew M C et.al, 2012, Evans et.al, 2012).

Dietary sources: There are many dietary sources that provide Vitamin E, such as nuts, seeds, green vegetables, and vegetable oils. Vitamin E is widely distributed in foods like vegetable oils, cotton seeds, sunflower seeds, egg yolk, and butter (Traber M G et.al, 2012).

h. **Vitamin K:** Vitamin K helps in blood clotting and plays some role in bone health. There is some evidence to suggest that the rate of fracture in post-menopausal women can be reduced by Vitamin K (Cheung A M et.al, 2008). Evidence suggests that Vitamin K has a role in cognition and better memory performances (Presse N et.al, 2013).

Dietary sources: Good natural food sources that provide Vitamin K are vegetables like spinach, asparagus, broccoli, beans, soya beans, strawberries, eggs and meat. Cow's milk is a richer source of Vitamin K (Schurgers, L. J., 2007).

B. Minerals and trace elements

a. **Iron:** Iron is one of the most needed minerals useful for numerous important functions of the body. Notably, it plays the role of carrying oxygen to tissues through haemoglobin and myoglobin. Iron, being associated with immune functions, the deficiency of iron increases the risk of infectious diseases more in elderly people. The lower level of iron may result in a poor supply of oxygen to tissues and may produce symptoms of iron deficiency, including hypochromic anaemia, fatigue, weakness, paleness, spoon-shaped nails, cheilosis, glossitis, headaches, and tachycardia (Ahluwalia et.al, 2004, Good win J S, 1995, Thomas DR, 2004).

Dietary Sources: There are two forms of dietary iron: heme and non-heme iron. The former is easily absorbed in the abdomen and frequently found in beef, fish, poultry, and pork. The latter is found in plant sources such as beans, dried fruit, enriched grains, and fortified cereals (McCall K A, 2000).

b. **Zinc:** Cellular metabolism is largely dependent on zinc. In more than 300 different enzymes, zinc is essential (Bogden JD, 2004). It is important for cell structure and regulatory functions, immune response, growth and development, neurological function, and reproduction. Even a mild deficiency of zinc can reduce immune function in elderly people (Nuttall J R, 2014). In elderly people, it is also associated with Alzheimer's disease, dermatitis, diarrhoea, depression, subdued appetite, and impaired taste (Shils M E, 2006).

Dietary sources: The dietary sources that provide a good amount of zinc are beef, poultry, pork, fish, legumes, nuts, fortified cereals, and dairy products.

c. **Calcium:** Various physiological processes such as muscle contraction, hormone secretion, and nerve impulse transmission, as well as those functions, which are an essential co-factor for multiple enzymes, have calcium as a vital element. Particularly for elderly people, the role of calcium in bone health and the prevention of osteoporosis is of primary importance (Institute of Medicine, US, 1997,. Ross A C et.al, 2011).

Dietary sources: The best dietary sources providing calcium are milk, yogurt, and chillis. Smaller amounts of calcium are found in dried beans, kale, spinach, and tofu. In addition, food fortified with calcium are fruit juices, milk alternatives, etc.

3. Hydration

Elderly people become reluctant to drink water frequently. This adversely affects many physiological functions, including the viscosity of blood and the movement of bowels in the intestines. Hence, the

elderly people may be encouraged to drink more water/liquids as the need may be (Pirlich, M., & Lochs, H. 2001).

The above discussion not only brings forth the complexities in the nutritional status of elderly people, but also calls for continuous monitoring/supervision and individualized attention in every case.

The Yogic concept of diet

The macro and micronutrients and the caloric concepts of diet can be regarded as modern dietetics. However, ancient literatures are full of detailed description about diet, its components, and dietetics. Although Yogic texts do not specifically indicate any special diet for elderly people, the texts of Hatha Yoga has clearly mentioned about the *Do's* and *Don'ts* regarding diet during the initial phase of Yoga practice. It focuses on both the quantitative and qualitative aspects of diet as well as the methodology of its preparation and consumption. As the science of Yoga and other ancient scriptures believe that the dominance of *Sattva Guna* is good for blissful existence, the components of *Rajas* and *Tamas* must be kept under strict check, which can be easily done through a selective diet. Further, the quantitative aspect also has been stressed through the concept of *Mitahara* (moderate eating) in ensuring good health and preventing many disorders (Digamber ji, 2001, Digamberji,1997,. Srisachandravasu R B, 1914).

Mitahara: Eating wholesome food offered first to the Divine, with one-fourth of the stomach kept empty is *Mitahara* or moderate eating as per *Hatha Yoga Pradipika* I:59.

The body needs energy to survive, so the Yoga practitioner needs to learn how to live on a proper diet in tune with Yogic discipline. Hatha Yoga texts provide guidelines on how to practice *Mitahara*. This includes eating only until three-fourths of the stomach is full to provide space for air and water to move the contents of the stomach. Eating only fresh, nutritious, and plant-based food is essential to achieve success in the Yogic path or discipline.

Shrimad Bhagavad Gita talks about the different types of diets by people of different temperaments. The important aspects of it are mentioned below (Easwaran E, 1985).

a. Foods that enhance longevity, increasing *Sattva Guna*, strength, health, happiness, and cheerfulness, which are juicy, unctuous, nourishing, cardiotonic, and palatable, are often liked by persons dominated by *Sattvik* temperament.

b. Foods that are pungent, sour, and salty in taste, very hot, penetrative, dry, and acidic in nature are liked by people who are dominated by *Rajasik* temperament, and such foods produce pain, grief, and diseases.

c. Foods cooked more than 3 hours before consumption, tasteless, putrid, stale, refused and impure in nature are liked by people who are dominated by *Tamasik* temperament.

A detailed analytical study on 'Linkage of the Modern and Yogic concepts of food' carried out by Vaishali Agte *et al.*. (2007) confirms that the concepts of *Sattvik, Rajasik,* and *Tamasik* diet have relevance to the references found in the classics regarding their nutritional status and the psycho-physical effects. After careful scrutiny of around 110 cooked eatables on scientific guidelines, it was derived that some foods listed under *Sattvik* may not contain the levels of micronutrients as per the Recommended Dietary Allowances (RDA), but all other qualities of good food were found to be intact. The *Rajasik* and *Tamasik* also followed the same line. Usually, a person is conditioned by the type of diet eaten and the traditional belief suggests that there is a connection between the expression of moods/thoughts and the diet consumed.

Table 2 lists such foods that are common in Indian households divided as per the probable *Sattvik*, *Rajasik*, *Tamasik* qualities and their average micronutrient contents.

Table 2. Micronutrient densities and qualities of common foods found in Indian households

Micronutrient Density unit/1000 kcal / MJ of energy	***Tamasik***	***Rajasik***	***Sattvik***
Low (0.3–15.2)	Biscuit, fermented rice flour with jaggery and ghee (anarasa), pickles (achar),wafers	Coffee, tea, sherbet, jam, puri, pancake of split Bengal gram, jaggery, wheat (puranpoli), fermented and fried refined wheat flour rolls, sweets (jalebi), ice cream, chocolate	Rice, ghee
Medium (16–46)	Mixture of fried lentil, pulses (pharasan), mixture of puffed rice with pharsan, peanut, onion, tomato, jaggery, tamarind, chilli (bhel), fried rolls of mixed grains (rice, wheat, bajra, jowar) flour (chakli, bhakharvadi)	Peanut–jaggery balls, curds with rice flakes, semolina with ghee, sugar (shira/suji), salty semolina (upma), sago –peanut–ghee (sago khichadi), samosa, shallow-fried pancake of cereal and legume flours (thalipeeth), patties, onion pakoda, fried balls of fermented split black gram (meduwada)	Milk, steamed rice flakes with onion (kandapohe), idli, curds, chapati, sorghum roti, pearl millet roti, onion stalks, ambadi, split red gram, split Bengal gram, field beans, French beans, apple, potato
High (48–1474)	Egg, meat	Rice–split black gram shallow-fried pancake (uttappa)	Sprouted beans, fenugreek leaves, pumpkin, brinjal, guava, custard apple, papaya, kale, cabbage, shepu, colocassia, flower, bottle gourd, cluster beans, snake gourd, buttermilk with split Bengal gram flour (kadhi), beet, cucumber, tomato, carrot, radish, rice with split green gram (moong khichadi), spinach, amaranth, capsicum, bitter gourd, ridge gourd, lady's finger, banana, pomegranate.

Similarly, to switch over from other types of diets to a micronutrient-rich, low-fat *Sattvik* diet, the following table (Table 3) may be useful for elderly people.

Table 3. Do's and don'ts of a *Sattvik* diet

Timings	Food to be avoided	Food to be included
Morning	Tea/coffee	Milk/fruit juice/herbal tea
	Bread/cake	Idli without sambhar but with green chutney/upma or poha with vegetables/whole-wheat bread
	Egg/omlette	Soya milk
	Puri/kachori	Thepla/handvo
Afternoon – Lunch	Puri/Alu paratha/rice	Chapati/roti/spinach paratha/methi paratha/ vegetable-stuffed paratha/rice with vegetables and sprouts with less spice
	Masoor, urad, brinjal	Mung, karela, tomato, sprouts curry
	Spicy curry, onion, garlic	Spinach/fenugreek/red amaranth
	Sweets	Fruits, vegetable salad (cucumber, cabbage, tomato, beetroot, radish, spinach, fenugreek leaves), almonds, dates
Evening – Snacks	Samosa/potato wada/meduwada/ missal/ dosa/uttappam/noodles/ pizza	Ragi-thalipeeth/sprout-bhel, dhokla, khandvi, colocassia-wadi/thepla/baked samosa/idli/ dahliasoya upma/garden cress laddu/baked chat/ baked karanji
Night – Dinner	Pau bhaji/kachchhidabeli/puri/ biryani	Roti made of whole wheat, bajra or ragi/ unpolished rice/mix-sprouts khichadi/ moong khichadi
	Chicken curry/mutton/fish	Vegetable soup/sprouts and leafy vegetable salad
	Ice cream/Srikhand/gulab jamun/ sweets	Milk/fruit-salad/milkshake/garden cress kheer

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08 ROLE OF YOGA FOR GERIATRIC POPULATION

Old age should be regarded as a normal, inevitable biological phenomenon. Over the years, the ageing process has brought many changes in the life of an individual. One such change is the body becoming vulnerable to many problems due to lack of regenerative processes and an increase in degeneration. The psychological and psycho-social issues generated during the ageing process add complexity to its management. At the macro level, the ageing of citizens has its impact on a country's overall health condition, policies, and financial management. Therefore, governments across the world treat the issue of ageing of their citizens with all seriousness. For instance, On December 14, 1990, the United Nations General Assembly voted to establish October 1 as the International Day of Older Persons as recorded in Resolution 106/45. International Day for the Elderly is celebrated every year on 1st October. This day is observed to focus on the importance of senior citizens who sometimes are neglected in our society. WHO adopted the theme "Take a Stand against Ageism" while celebrating the International Day for the Elderly on 1 October 2015.

All these messages were aimed at improving the quality of life of the aged. As per the United Nations, persons of **60+ years of age and older** are defined as elderly (Bowling, A. 2005). Successful ageing is multi-dimensional in nature, with key ingredients as (a) avoidance of disease and disability, (b) maintenance of cognitive and physical functions, and (c) sustenance of social and productive activities.

The science of Yoga, a practical spiritual science, empowers an individual to attain a state of holistic and integrated development in all aspects and at all levels. Various scientific studies have documented its potential to normalise the psycho-physiological functions of an individual. Yoga is basically a science that leads to ultimate liberation (*Moksha*). The Yogic way of living provides a popular by-product in the form of attaining a dynamic state of health and well-being. However, this depends on the *Karma* of an individual manifested as the genetic predisposition and the conditioning of the environment in which one is born. The main focus or the central theme of Yoga happens to be the golden mean, locating the middle path, a constant drive for improvisation and moderation, and a harmonious homeostatic balance. Yoga, the uniting impulse of life, always thrives to create a union of diverse streams into a single powerful flow. The judicious practice of science generates inner balance of the mind that remains serene and stable even amidst chaos. This potent ancient science guides its followers to a clear path ensuring the enduring stability even when there are lots of external turmoils (Bhavanani, A. B. 2013).

Mastery in Yoga can be achieved by anyone who may be young, old, very old, diseased or emaciated, if the practice is continued regularly without being lethargic and lazy (Digamberji S, 2001). This also suggests that the practice of Yoga can be undertaken and may prove beneficial for elderly people.

Yoga, the science of union, guides an individual through a number of practical techniques and advises a proper lifestyle helping to attain and maintain a state of health and well-being. External (*Bahiranga*) practices like *Yama*, *Niyama*, *Asana*, and *Pranayama* help to produce the social and physical health while *Pratyahara* and internal (*Antaranga*) practices like *Dharana* and *Dhyana* work on producing psycho-spiritual health. Yoga, with special emphasis on the psycho-neuro-immuno-endocrine axis, functions towards harmonising all the systems of the human body. Yoga also intends to promote positive health, which would help an individual to overcome the health challenges during the whole span of life. This is a unique contribution of Yoga to modern health care as it carries out both roles – promotion of health and prevention of diseases. Further, it is cost-effective in nature, and it can be well integrated with other systems of medicines to benefit the sufferers (Stephens, I. 2017).

Shifting from individual to universal self

The science of Yoga emphasises universality, which is an antidote to modern human activities, which usually glorify the individuality. A person masked by ego will soon face the conditions of despair and depression, being overwhelmed by his own superficiality. Yoga, in contrast, visualises the universal aspect of spiritual nature and perceives the unity of the entire creation. Yoga helps one find an endless fountain of inspiration and bliss. In a nutshell, the practice of Yoga helps an individual to evolve from an 'I-centric' approach (*Vyashti*) to 'We-centric' approach (*Samashti*). Thus, it may be understood that having Yoga as a way of life leads to an immensely conscious and aware physical, mental, and emotional existence enables to gain conscious control over all aspects of life. This also happens owing to a practice of detachment where the work is for the sake of work only and not for any reward or presumptive gains. These attitudes will produce dexterity in all actions. Complete concentration and control are generated because of a continuous practice (*Abhyasa*/*Sadhana*). Detachment from the fruits of the action generates the greatest efficiency as an individual keeps aloof from competitive and goal-oriented thinking. These practices, as a whole, reform a person, and the individual self evolves to become a universal self (Bhavanani, Y. D. A. B.2013., Tolahunase, M,.2017).

Holistic Approach of Yoga

Yoga has a holistic approach towards life, which helps an individual to improve in all spheres of existence. The use of natural resources like sunlight, air, and water for various practices and careful observation of diet are suggestive of the all-round care that Yoga helps an individual through his/her daily requirements Yoga does so without manipulating the natural laws of rejuvenation and healing. It also clearly demarks the understanding and need of an 'exertion–relaxation' cycle for getting the ultimate balance within. With an increasing awareness about introvertedness, extrovertedness gradually subsides and leads an individual to depend less or no external means of entertainment and/or addictive substances. This benefits not just the personal health but social health also. Further, an understanding of the philosophy of Yoga enables one to develop inner peace and equanimity, which will help to decrease the suffering from pleasure or pain and other such dualities in day-to-day life. Decreasing or refraining from socialising will help in decreasing social problems, and regular introspection would help one to understand one's own true nature and bio-rhythmic patterns. This holistic approach will aid in reaching the goal of total health.

Initiation of the Elderly to Yoga Practices

Kavitha S and Kumudini Achchi (2015) in their study stated Yoga and Pranayamas were considered the cheapest means of gaining new strength and energy for the institutionalized elders in the modern technological era to have a stress-free life. However, the fact remains that a huge number of elderly people are devoid of this knowledge or do not have the inclination to start something new at that ripe age. At times, they may not have the required facilities or lack of initiation to start Yoga practices. Some simple suggestions or moderations in their daily activities may boost the process of going for Yoga practices.

It is a fact that senior citizens need to have ample amount of rest and must avoid straining their joints and musculature as damage to the body may turn out to generate somatopsychic problems. Therefore, it is essential to counsel elderly persons to avoid high-impact activities as well as weight lifting (if they are not trained and used to it). They may be instructed to take short breaks while doing any prolonged activities like driving, watching TV or working on a computer, etc. Guidance about a healthy overall posture with the neck aligned to shoulders and spinal column also needs to be incorporated. Gentle stretching and strengthening practices involving breath and body, coordination such as *Jathis*, *Sukshma*, *Sthula Vyayama*, and other activities may help to restore psycho-somatic harmony, which is the root cause of

many health issues. Such practices can usually be done by most older adults and seem to be a good way to introduce Yoga practices in a gentle and safe manner in the initial stages. This may then be fortified by inclusion of other simple and gentle *Hatha Yoga* practices, which helps to facilitate a psychosomatic balance. All such practices must be done with an awareness of the body and spine movements as well as conscious rhythmic breathing (Ingle, G. K., 2008).

The thymus gland is important for the proper functioning of the immune system. In this context, twisting postures like *Vakrasana* create a healthy flow of vital energy (*Prana*) into the heart centre (*Anahata Chakra*). The *Brahma Mudra*, done with breath sequence and appropriate vibrational sounds, such as AAA, OOO, EEE, and MMM, can relax and energise the neck region and relieve the frequent occurrences of pain in the neck. Along with that, it also energises the whole central nervous system with an enhanced flow of *Prana,* providing beneficial effects, namely, boosting self-confidence, mood, and memory. For elderly people, it is advisable to work with a partner in Yoga practices to remove phobias, gain self-confidence, and provide necessary physical support.

It is important that the patterns of the body movement and breath must be well synchronised during Yoga practices. In the practice of *Kriya* or structured movements like *Suryanamaskara*, the lifting of the body is done on inhalation and lowered on exhalation. Some breathing patterns like *Bhastrika* (Bellow Breathing) are useful to strengthen the entire solar plexus area, including the diaphragm, which builds up stamina and facilitates internal cleansing of the organs and the circulating life force. *Kapalabhati* happens to be another dynamic breathing technique that enables the warding off of depressive conditions as it creates a sense of activation. The *Suryabhedana* and *Ujjayi Pranayamas* can also help in the activation of healthy well-being. The three locks (*Mula-Uddiyana-Jalandhara Bandhas*) as well as the *Ashvini Mudra* act on revitalising the whole psycho-neuro-endocrine system and, thus, affect positively on depression. The *Aum* chanting (*Pranava*) and the Bee Sound (*Bhramari*) *Pranayama* create an inner harmony resulting in the attainment of mental calmness and bliss, thus initiating the inherent regenerative processes. The pattern of breath has a direct correlation with the energy level, lifespan, state of mind, clarity of thought and quality of emotions (Ramanathan, M, 2014). *Pranayama* also helps in reducing hyper-reactivity to day-to-day tensions and thus enables senior citizens to relax better, which culminates in a better quality of sleep and enhanced quality of life. Yogic techniques of relaxation like *Shavasana* and *Yoga Nidra* help to remove stress, producing autonomic balance; they aid in correcting the faulty psychosomatic conditioning prevalent in elderly people.

Practices like *Pratyahara* (withdrawal of the senses), *Dharana* (focused concentration), and *Dhyana* (meditation) work towards modulating the individual perspectives and normalising the higher functions, crafting a rational and positive attitude towards life. Focusing between the eyebrows (*Antah* or *Bhrumadhya Trataka*) helps in activating the brow centre (*Ajna Chakra*), energising the neuro-endocrine axis. *Dhyana* (meditation) on energy centres (*Chakras*), with a special focus on the heart centre (*Anahata Chakra*), would activate the thymus, thus potentiating the elderly against immunological issues as well as strengthening cardiac functioning. Repetitive recitation (*Japa*) of *AUM* and *Soham* mantras are other potent methods for sharpening the focus (Bhavanani, Y. D. A. B. 2013).

Yoga in Caring for the Caregivers

Taking care of an elderly requires a lot of patience and perseverance as the conditions are usually irreversible, and pursuing someone to cope is hard. Further, the mood shifts, irritability, obstinate behaviour, etc., attitudes of the one being cared for – may generate feelings of anger, resentment, guilt, hopelessness, etc., in the caregiver. The caregiver also goes through physical, psychological, emotional, and economic strain and drain. Lack of time to rest, relax, and entertainment adds to this tally. Many a time, the caregivers may easily fall victim to depression and other problems. Yoga may prove beneficial

to such people. Proper understanding of the concepts of *Karma* (action), *Dharma* (code), *Seva*(service), *Daya* (mercy), *Karuna* (compassion), etc., along with some Yoga practices, may prove beneficial for the caregivers. To reiterate the point, Waelde LC *et al*..have stated in their paper, titled 'A pilot study of a Yoga based intervention for dementia caregiver stress', that a Yoga – meditation programme may be an effective intervention for the family or caregivers of an elderly person for enhancing the extension of services, coping and keeping one's stress levels to normal (Waelde LC,2014).

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09 METHODS OF INSTRUCTION FOR YOGA PRACTICES IN GERIATRIC POPULATION

Health and wellness are common goals desired by people of every age. However, owing to varied reasons, they need to be cared for, supervised, and at times even kept motivated, especially children and elderly (Uma P, 2012). A child is often unaware of the requirements and long-term effects of different activities they indulge in. In the case of the elderly, although they have the maturity, knowledge, and experience of life, they tend to develop a casual approach and self-neglect towards health maintenance in their greying years of age. The physical, psychological, social and security issues worsen this condition. Therefore, today, there is a need to focus on healthy and graceful ageing, considering especially such factors as deteriorating ecological conditions and increasing life expectancy.

The health benefits of regular Yoga practices are no longer a secret, if one goes by its increasing popularity and numerous evidence-based studies. It is one of the most cost-effective and easily adoptable methods for maintaining and regaining health, happiness, and harmony with minimal requirements and prerequisites. Further, it can be easily imbibed in one's routine lifestyle. The major difference between other methods of health maintenance and Yoga is that in other methods, an external support or device or assistance is required or an internal ingestion of some substance or drug is necessary, where the amount of self-responsibility and active participation of a person decreases comparatively. However, in the case of Yoga, everything depends on how regularly and devotedly an individual offers one's own self to do the necessary practices. As active participation is a prime requisite, the main concern is about the amount of time to be devoted and the psychophysical fitness and preparedness of the individual.

A study carried out by Kavitha S and Kumudini Achchi (2015) stated that the majority of elders are well aware of the significance of Yoga and its positive health benefits and showed interest and readiness to practice Yoga. The elders also agreed that there are good opportunities to learn Yoga, but the outcome is less owing to lack of interest, continuous motivation, physical problems, etc. This is where the role of the caregivers, instructors, designing of the practice, etc., comes into play. Some healthcare providers also project that owing to their age, maintenance of health and wellness and activities related to prophylactic measures may not be much helpful for the elderly. On the contrary, Yoga is not an age-specific concept as it is required by all. Although a variety of chronic disorders may be causing serious defects, adopting and maintaining a healthy lifestyle can actually delay such defects, as per some studies. Yoga for wellness and prevention of diseases has proved to be effective, especially in inducing a lifelong behavioral change, as indicated by research studies.

As the elderly population is at a high risk of major diseases and defects, their health education needs to be handled with the utmost care by the members of health care community/units (Reicherter and Greene, 2005). Health education links directly to the promotion of health in both clinical and educational preparation fields (Choi *et al.*., 2010). The initial portion of Yoga practices falls under the category of education as the practitioners are taught and trained in Yogic aspects and practices.

Senior citizens are regarded and respected in society. They have limitations due to decreased physical strength, flexibility, and with individually conditioned psychological responses. Therefore, the planning of Yoga practices and the mode of instruction to be given to them need special attention. Based on the findings of some studies on communicating with geriatric people, geriatric education, geriatric nursing, planning the Yoga interventions for randomized trials, etc., (Smith, 2006, Cornett, 2011, Karen J. Sherman, 2012), a methodology for the same may be charted out as given below.

1. **Style/School of Yoga**: Today, there are many styles/schools for imparting the knowledge of Yoga available in society. Keeping the necessity of an individual or the target group in mind, the most suitable style of performance must be selected, keeping safety and appropriateness in view (e.g., rigorous manner or calming manner).
2. **Frequency and Duration:** All bodies are not alike, and hence the requirement of everybody is different. This segment indicates the need of planning the frequency and duration of practices with regard to the duration and frequency of practice sessions. These aspects will depend on the requirement and conditions of the person or a given group. This level of planning will help address such questions as (a) how long should be the Yoga practice time in a day; (b) how long a given *Asana* should be performed; and (c) how many times in a day/week the practices must be repeated.
3. **Yoga Practices:** There are eight limbs of Yoga, according to sage Pantanjali and all are equally important for attaining spiritual bliss and self-evolution. However, their practice may be altered based on the health condition of the practitioner. For instance, a person suffering from back pain may need more focus on posture-related *Asanas* and a person with hypertension may need more meditative practices.
4. **Specific Class Sequence:** After deciding on the practices, it is necessary to set a sequence for them based on, for example, the need and condition of the practitioner and the time of the day/season.
5. **Inclusion of Modification:** Not all people are able to perform every practice uniformly. Therefore, keeping the physical limitations in mind, the required improvisations and modifications in the given practice/s may be incorporated in a way that the Yoga practice may yield proper potency and the benefit. The use of proper props and support devices may be required for a person with limited flexibility or the final posture may be improvised instead of avoiding the whole posture itself.
6. **Instructors:** The knowledge, skill, nature, and communication of an instructor/expert must be sound in all aspects so that the practitioner does not get a negative impact from the practices and his/her interest in doing Yoga is sustained.
7. **Facilitation of home practice:** The ultimate goal of Yoga is *Kaivalya* or merging with the Supreme, which would be adversely affected if the practices are always done in a group. Therefore, the practitioners are encouraged to do their practice at home as well. This will also test their ability to memorise and recall the practices, their names, and the methodology of doing the practices, thus helping an individual to evolve and be self-supportive.
8. **Evaluation of the Effects:** Training an elderly is a challenge in itself. Yoga practices are done to generate the desired results. Therefore, it is important to evaluate the progress made and benefits derived at regular intervals through proper documentation procedures, even through audio-visual means. Such evaluation would help to understand the effectiveness of the practice also.

Besides the above considerations, the following points would make the instructions and Yoga training for elderly persons more meaningful.

- Prior to the starting of Yoga practice sessions, a detailed counseling must be done.
- The condition of the health of an individual must be examined, if required, needed medical advice must be asked for.
- Instruction/teaching should be imparted by using short, simple, and proper words and all ambiguities must be avoided.
- While instructing, instead of an authoritarian attitude, a calm and understanding approach must be adopted in communication.

- The voice must be clearly heard with the correct pronunciation.
- The information must be repeated frequently till they are properly understood.
- Important parts of information or some specific important information should be written on cards.
- If required, pictorial information may also be prepared.
- Exaggerations in any form must be avoided.
- Judicious use of *Maitri* (friendliness), *Karuna* (compassion), *Mudita* (pleasuring), *Upeksha* (ignoring) must be imbibed to make the instructions effective (Goyanka. H, 2016).
- Yoga sessions should be kept short and may be repeated.
- All possible sources for the individual and his or her family should be used.
- Appropriate learning style for a given individual must be derived, and training must be organised in this direction.
- The training should be supported by visual tools such as videos.
- Assistance from the individual's family members, relatives, neighbours, and volunteers must be accepted and encouraged.
- The desire to learn and the joy of life must be kept alive through motivation and appreciation.
- There should be no frowning. An ever-smiling, positive, optimistic, and open-hearted attitude must be kept.
- The session must be conducted in an indoor, peaceful, serene, noise- and pollution-free environment.

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10 YOGA PROTOCOL FOR GERIATRIC POPULATION

Designing a generalised Yoga protocol for elderly people needs scrutiny of many aspects related to the physio-psycho-socio-spiritual aspects of individuals. Based on (1) a study carried out by Hariprasad V R *et al.*. (2013) regarding designing a validated Yoga intervention protocol for the elderly, (2) a selection from the classics of Yoga, and (3) the publications about geriatric care by the Morarji Desai National Institute of Yoga, two protocols – one for a shorter duration of time (30 minutes) and another for a longer duration of time (45 minutes) –have been incorporated in the forthcoming pages along with a few general guidelines to be followed before, during, and after the Yoga practices.

General guidelines for Yoga practices

A Yoga practitioner should follow the general guidelines while performing Yogic practices.

1) Before the practice

a. Cleanliness is an important requirement for Yogic practice. It incorporates the cleanliness of the body, purity of the mind, and serenity of the surrounding.

b. Yogic practices should be performed in a calm and quiet atmosphere with a relaxed body and mind.

c. Yogic practice should be performed on an empty or light stomach.

d. On feeling weakness, a small amount of honey in water at room temperature may be consumed.

e. The bladder and bowels should be evacuated.

f. A Yoga practice should be done on a Yoga mat, simple mat, or folded blanket.

g. Clothing must be light and comfortable, made from cotton or natural fibres.

h. Yoga practice must not be performed in a state of exhaustion, illness, in a hurry or in conditions of acute stress.

i. A Yoga therapist or a physician must be mandatorily consulted prior to performing yogic practices in case of chronic disease/pain/cardiac problems, etc.

j. Yoga experts must be consulted before doing Yogic practices.

2) During the practice

a. A practice session should start with a prayer or an invocation as it creates a conducive environment to relax the mind.

b. Yogic practices must be performed slowly, in a relaxed manner, with an awareness of the body, its movement, and it's breath.

c. During any of the practices, the breath should not be held or stopped unless it is specially mentioned to do so.

d. Breathing should always be through the nostrils unless instructed otherwise.

e. The body should not be held tightly or jerked at any point of time.

f. The practices must be performed according to individual capacity.

g. Exaggerations or the use of force must be consciously avoided.

h. It is essential to do practices persistently and regularly as good results are achieved only after sometime.

i. The instructions of the Yoga instructor/expert must be heard and understood properly before going into the practice.

j. There are contra-indications/limitations for each Yogic practice, which should always be understood and kept in mind.

k. A Yoga practice session must end with a meditative practice/deep silence/*Sankalpa* /*Shanti Patha*.

3) After the practice

a. Bath may be taken only after 20–30 minutes of practice.

b. Food may be consumed only after 20–30 minutes of practice.

Precautions for Yoga practices:

- Yoga practices should not bring undue pressure on the muscles and the heart.
- Vigorous and jerky movements should be avoided to reduce the danger of injuries.
- In Yoga practices, abrupt stretching of muscles, excessive twisting and holding of breath should be avoided.
- Breathing out consciously is more important.
- Regular Yoga practice is better than intermittent practice.
- The diet, bowel movements, sleep, rest and recreation should be regulated.
- Emphasize proper relaxation and practice of controlled respiration.
- Include leafy vegetables, raw vegetables and fruits to provide roughage in the diet.
- Pay more attention to spiritual activities and keep yourself busy with some favorite activity.

The Yoga Protocol for GERIATRIC Population (30minutes)

S. No.	Yoga practices	Rounds	Duration
1.	**Prayer**		1 minute
2.	**Yogic Sukshma Vyayama** (micro circulation practice)		5 minutes 8 minutes**
	a. Neck movements:		
	• Forward and backward bending	3 rounds	
	• Right and left bending	3 rounds	
	• Right and left twisting	3 rounds	
	• Neck rotation (Clockwise and anti-clockwise)	3 rounds	
	b)Shoulder movements		
	• Shoulder stretch	3 rounds	
	• Shoulder rotation (forward and backward)	3 rounds	
	c)Trunk movement		
	• Trunk twisting (*Kati Shakti Vikasaka*)	3 rounds	
	d)Knee movement	5 rounds	
	e)Ankle movement		
	• Ankle stretch	5 rounds	
	• Ankle rotation	5 rounds	
3.	**Yogic Sthula Vyayama**		
	• *Rekhagati*	2 rounds	
	• *Urdhva-gati* (upward movement)	1 round	
	Surya Namaskara (at slow pace) **	3 rounds **	5 minutes**
4.	**Yogasanas**		
	a) Standing postures		
	• *Tadasana*		
	• *Utkatasana*		
	• *Urdhva Hastottanasana*		
	• *Kati Chakrasana*		
	• *Trikonasana*		12 minutes 15 minutes **
	b) Supine postures		
	• *Pawanmuktasana*		
	• *Sarala Matsyasana*		
	• *Viparitakarani***		
	• *Setubandhasana*		
	• *Shavasana*		
	c) Prone postures		
	• *Bhujangasana*		
	• *Makarasana*		
	• *Dhanurasana*		

	d) Sitting postures		
	• *Vakrasana/ Ardhamatsyendrasana*		
	• *Ardha Ushtrasana/ Ushtrasana*		
	• *Janu Shirsasana / Pashchimottanasana*		
	• *Uttanamandukasana*		
5.	**Kapalabhati** (optional)	(10–20 strokes)	1 minute
6.	**Pranayama**		5 minutes 7 minutes**
	• *Ujjayi Pranayama*	3 rounds 5 rounds**	
	• *Nadi Shodhana/ Anuloma-Viloma Pranayama (Alternate Nostril Breathing)*	2 rounds 3 rounds**	
	• *Bhramari Pranayama*	3 rounds 5 rounds**	
7.	**Dhyana**		5 minutes
8.	***Shanti Patha***		1 minute
	Total:		**30 minutes**

***Note: As this protocol is for elderly people, proper supervision and caution must be exercised in order to avoid any unwanted consequences.**

**** Note: These asanas may be added/modified for long duration practice (45 minutes).**

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11 EVIDENCE-BASED RESEARCH ON GERIATRIC POPULATION

Many evidence-based research works covering Yogic interventions in various conditions of health and diseases in elderly people have come up in past few years. Brief details about the available studies are presented below.

1. V.R. Hariprasadet al.. (2013) conducted a study on the Effects of yoga intervention on sleep and quality-of-life in the elderly: A randomized controlled trial and concluded that Yoga interventions seem to improve the quality of life and quality of sleep of elderly people living in old-age homes.
2. David Haber (1983) carried out a research work titled, Yoga as A Preventive Health Care Program for White and Black Elders: An Exploratory Study. This work has revealed that the regular practice of Yoga would improve psychological well-being and also show a lowering effect on the systolic blood pressure level. On the other hand, doing Yoga practices only once a week may not yield the desired results.
3. Pranay Kumar Gupta et al.. (2010) conducted a research study on *Anuloma-Viloma Pranayama* and Anxiety and Depression among the Aged, which revealed that regular practice of *Anuloma-Viloma Pranayama* for three months, was able to decrease the level of anxiety and depression in senior citizens.
4. **Allen KS *et al*..** (1987) carried out a study titled *Yoga in a Geriatric Mental Clinic: Activities, Adaptation & Aging*. Elderly people living in an independent retirement community were subjected to a weekly 60 minutes beginner Iyengar Yoga practices. The practices were tailored to individual functional levels using probes, which included stretching, flexibility, endurance, balance, and relaxation practices. Pre- and post-interventions at baseline, 12 weeks, and 1 year duration revealed that Yoga improved gait and balance, decreased pain, decreased the need for medications, decreased stress, improved sleep, less anxiety and depression, increased mobility, increased self-awareness, and greater sense of peace. No adverse events were reported. However, care-giving obligations, relocation, and perceived interference with religious beliefs hindered subjects' ability to fully participate. Older adults' perceived Yoga benefits extended to mental, psycho-social, and spiritual health. Caregiving obligations and religious belief conflicts deserve further exploration in future Yoga interventions for recruitment and retention of participants.
5. A research carried out by Harinath K, et al.. (2010) on Effects of *Hatha yoga* and *Omkar* meditation on cardio-respiratory performance, psychologic profile, and melatonin secretion concluded that Yoga practices for 3 months resulted in an improvement in cardio-respiratory performance and psychological profile. The plasma melatonin levels also showed an increase, suggesting that psycho-physiological stimuli to increase the endogenous secretion of melatonin, which, in turn, might be responsible for improved sense of well-being.
6. **Loren M fishman *et al*..** (2009) carried out a work on *Yoga for osteoporosis: A Pilot study,* which included a small number of elderly people about the age of 68 years. Although suffering from osteoporosis or osteopenia, they were able to complete the total trial period of two years. During this period, they were subjected to 10 yoga postures with less holding followed by ample rest on a regular basis. The findings suggest that Yoga appears to have built bone mineral density in patients with osteoporosis or osteopenia.[vi]

7. Prachi Deshbhratar et al.. (2016) carried out a work titled To compare the effect of Pranayama and Breathing exercise on expiratory capacity in the geriatric population. In this study, 60 elderly people between the age of 55–75 years were divided in two groups of *Pranayama* (*Anuloma-Viloma* and *Bhramari*) and conventional breathing exercises for 12 weeks. The result showed that the group that practiced *Pranayama* increased the expiratory capacity.

8. **Indla Devasena *et al*..** (2011) conducted a study on *Effect of Yoga on heart rate and blood pressure and its clinical significance* where Yoga therapy was given for six months on healthy people above 40 years of age. Pre- and post-assessment suggested that the systolic blood pressure lowered to highly significant level, the diastolic blood pressure was reduced significantly, whereas the heart rate also decreased significantly, proving that Yoga intervention may provide significant improvement in ageing population in terms of reducing morbidity and mortality from cardiovascular disease.

9. A review article by **Kannan K *et al*..** (2015) on *Effectiveness of Pranayama on depression in elderly* includes the findings of the studies based on the research papers published on *Pranayama* and its effects on depression between the years 2000 and 2013. The article concluded that the statistics supported the effectiveness of *Pranayama* on treating depression of elderly people effectively. It further suggested that this information can provide guidelines to clinicians and health-care providers for inclusion of the practice of *Pranayama* in treating older people with symptoms of depression.

10. A research work carried out by David S Black et al.. (2015) titled Mindfulness meditation and improvement in sleep quality and daytime impairment among older adults with sleep disturbances involved randomized clinical trial in two parallel groups. One group went through with mindful awareness practices and the other with sleep hygiene education as interventions. Both these groups received interventions for six weeks (2 hours per week) with assigned homework. The results revealed that the participants in the mindfulness awareness practices showed significant improvements compared to those in the sleep hygiene education group. This benefit was recorded on sleep disturbances and on the secondary health outcomes of insomnia symptoms, depression symptoms, fatigue interference and fatigue severity.

11. **Lether land Leader *et al*..** (2013) in *Mindfulness and dementia: A report of pilot study*–carried out on people in the early stage of dementia– suggest that mindfulness meditation would improve the quality of life across a wide range of domains. These include reduction in anxiety, pain control, coping with the condition of dementia, regulations of emotions, improved sense of self, improved cognitive functioning, improved awareness and sense of appreciations, and improved interpersonal relationships.

12. **MK Taneja** (2016) carried out a study on *Bhramari (Shanmukhi Mudra) Pranayama in presbyacusis and dementia,* on15 middle-aged and senior citizens who did not benefit from wearing the hearing aid. After practising *Bhramari Pranayama (Shanmukhi Mudra)* for 3 months, 11 patients had an improvement of average 9 dB, 2 patients did not show any improvement. Out of the three known diabetic patients the blood sugar level of one patient came down to near normal limits, 5 patients having a history of forgetfulness bettered subjectively. This pilot study showed that there was an improvement in hearing in 11 (84.6%) patients and quality of life improved in 12 (92.3%) patients. Improvement was also found in diabetes or prostate symptoms.

13. **Amin H *et al*..** (2014) in their paper on *Memory loss in geriatric age and its prevention through yogic lifestyle* suggest that the eight limbs of Yoga–*Yama, Niyama, Asana, Pranayama, Pratyahara, Dhyana, Dharana, and Samadhi*–enhance the quality of the overall health of ageing populations. It further prevents the accumulation of stress metabolites and keeps the physiology supple.

14. **Dhar HL** (1997) in work titled *Health and aging* concludes that regular meditation is the key to health (physical, mental, and social well-being). It elevates the mind from a grosser to a subtler level and makes the body and mind follow nature's law of living. Meditation helps achieve good health, prevent diseases, improve performance, and control the ageing process. A balanced diet (less sugar, salt, and fat with advancing age, with proper supplementation of micronutrients) along with mild to moderate exercise (walking, etc.,) add to the effect of meditation.[xiv]

15. **VR Hariprasad, *et al*..** (2013) carried out an open-label exploratory pilot study testing the feasibility of the validated Yoga-based interventions on nine consenting elderly subjects having mild cognitive impairment. They were taught Yoga-based interventions for 1 month, where they were encouraged to participate daily with a minimum attendance of 12 sessions in one month. The post-intervention evaluation suggested that six (75%) subjects increased their physical ability, improved their memory condition, and were able to coordinate breathing with *Yogasana*; five (62%) subjects were able to perform breathing as instructed in *Pranayama* section of the Yoga module. All subjects reported one or more benefits, which according to them were due to Yoga practices. They also experienced an improvement in concentration, elevated mood, and improvement in backache. No adverse event was reported.

16. **Chen KM, *et al*..** (2008) carried out a research work, titled *Sleep quality, depression state, and health status of older adults after silver Yoga exercises: cluster randomized trial*, to evaluate the effect of 6 months of silver Yoga exercises. The Yoga intervention was aimed at promoting the mental health of elderly people in senior activity centres, focusing on their sleep quality, depression, and self-perception of health status. The participants were randomly bifurcated into two groups –experimental group and control group –based on their attendance at the selected senior activity centre. The subjects in the experimental group were allocated 70-min silver Yoga exercise program 3 times a week for 6 months. It was observed that after 3 months of intervention, many mental health indicators improved in the experimental group, which was maintained throughout the total duration of the study. After the completion of 6 months, sleep quality, depression, and health status improved in older adults. The results found in the experimental group were better than the control group.

17. **Donesky-Cuenco D, *et al*.**. (2009) published the results of their research work titled Yoga therapy decreases dyspnoea-related distress and improves functional performance in people with chronic obstructive pulmonary disease: a pilot study. The main purpose of undertaking this study was to evaluate a Yoga program for its safety, feasibility, and efficacy for decreasing the dyspnoea intensity and dyspnoea-related distress in elderly people with COPD. Clinically stable 29 patients (female -21) of average age 69.9 +/- 9.5 and having FEV_1 47.7 +/- 15.6% were randomised to a 12-week Yoga program specifically designed for people with COPD or usual care control. Carried out twice a week, the Yoga program included *Asanas* (Yoga postures) and *Vishama Vritti Pranayama* (timed breathing). Safety measure outcomes included heart rate, oxygen saturation, dyspnoea, and pain. Feasibility was measured by patient-reported enjoyment, difficulty, and adherence to Yoga sessions. At baseline and at 12 weeks, dyspnoea intensity (DI) and dyspnea-related distress (DD) were measured during incremental cycle ergometry and a 6-minute walk (6MW) test. Secondary efficacy outcomes included physical performance, psychological well-being, and health-related quality of life (HRQoL). After the program, the subjects tolerated more activity with less dyspnoea-related distress (DD) and improved their functional performance.

18. A research work titled *The effect of Yoga on mood in psychiatric inpatients* was carried out by **Lavey R, *et al*..** (2005) on 13 psychiatric inpatients to assess the effect of Yoga interventions on registered subjects with the profile of mood states (POMS). The results revealed that Yoga interventions provided

significant improvement on all negative factors of emotion that contributed to POMS– tension, anxiety, depression, anger, fatigue and confusion. The study reiterated the positive role of Yoga on mood improvement and stress reduction in the treatment of psychiatric inpatients.

19. A randomised control trial by **NK Manjunath** (2005/06) –*Yoga and Geriatric Care: an Evaluation of Positive Health Indicators*– reported improvement in various psycho-physiological parameters in geriatric population after 6 months of an integrated Yoga programme comprising *Asanas* (physical postures), *Pranayama* (breathing techniques), guided relaxation, and devotional sessions for 60 minutes a day/6 days a week. The improvement was observed in semantic, primary and working short-term memory and episodic memory. It was also noticed that depression scores and self-rated quality of sleep improved after the study period. These changes may be attributed to the possible reduction in anxiety and distractibility as well as increased secretion of 'feel good' hormones such as endorphins and reduced secretion of stress hormones. The control group showed deterioration in different aspects of functioning.[xix]

20. **Karel Nespor,** a Czech psychiatrist, (1993) in his article Twelve years of experience with Yoga in psychiatry", had identified lack of suitable physical activity and stimulation as the commonest problem. According to him, gentle joint exercises and relaxations are found to be beneficial and well-accepted by the patients. Regardless of the religion, Yoga enhances one's spiritual life and perspective beyond the physical life. A detailed outline of the potential benefits of Yoga in alcohol and drug abuse has been provided in this article. Stress, anxiety, and depression are relieved by Yogic techniques like relaxation and meditative practices. People practicing Yoga are usually not inclined to drug or alcohol abuse, which provides a safer social network. The feeling of helplessness, which is normally found in the patients of such abuses, is counteracted by increased self-awareness and improved self-control of one's physical and psychological nature. Yoga provides a safer non-pharmacological management of psychosomatic problems like insomnia, headache, and general body pain, thus reducing the use of addictive analgesics. Yoga aids people to come out of such abuses by helping them to overcome the stress of early abstinence after withdrawal symptoms.

21. A study by **Shapiro D, *et al*..** in 2007 – Yoga as a Complementary Treatment of Depression: Effects of Traits and Moods on Treatment Outcome–revealed that Yoga produces benevolent effects on emotional, psychological, and biological spheres, which can be observed by significant reductions in depression, anger, anxiety, neurotic symptoms and low-frequency heart rate variability with improvement in mood. Further, Yoga is a promising intervention due to its cost-effectiveness and easy implementation for depressives and other patients. 11 out of 17 patients (64.7%) subjected in this work achieved remission levels of their problems post-intervention. Participants who remitted differed from the non-remitters at intake on several traits and on physiological measures, indicative of a greater capacity for emotional regulation.[xxi]

22. **Sharma VK, *et al*..**(2006), in their study titled *Effect* of Sahaj Yoga on neurocognitive functions in patients suffering from major depression have talked about the effectiveness of Yoga in managing depression. Sahaj Yoga, in addition to improvement in various other cognitive domains seen with conventional anti-depressants, led to additional improvement in executive functions such as manipulation of information in verbal working memory and added improvement in attention span and visuo-motor speed of depressives.

23. The study by **Krishnamurthy MN and Telles S** (2007) evaluated the effects of two ancient interventions, namely, Yoga and Ayurveda, on 69 subjects older than 60 years of age living in a residential home. All the subjects were suffering from geriatric depression. For the study – titled *Assessing depression following two ancient Indian interventions: Effects of Yoga and Ayurveda on older adults in a residential*

home–the subjects were randomly segregated into three groups –Yoga, Ayurveda, and wait list control – after stratifying them by age and gender. Three assessments using the 15-item geriatric depression scale were used prior to the intervention at the end of 3 months and after 6 months post intervention. The Yoga program, which lasted for 7 hours and 30 minutes per week for 24 weeks, had included physical postures, relaxation techniques, regulated breathing, devotional songs and lectures. The Ayurveda group received a herbal preparation twice daily for the total duration. After the 3 and 6 months periods, the Yoga group showed a significant decrease in the depression symptoms score – from the average baseline of 10.6 to 8.1 and 6.7, respectively ($p<0.001$, paired t-test). There was no change in other groups. The study concluded that an integrated approach to Yoga (with the inclusion of mental and philosophical aspects, and physical practices) was useful for institutionalized elderly people. [xxiii]

24. The study by **Beena Ranu K** (2013) entitled *Yogic practice and diabetes mellitus in geriatric patients* concluded that Yoga improves the risk profile induced by stress in geriatric patients with type 2 diabetes mellitus as well as preventing and delaying its complication. In this study, 73 patients of type 2 diabetes mellitus in the age group of 60–70 years with a chronicity of 5–10 years and poor glycemic control (HbA_{1c} >8%) were enrolled and divided into three groups according to their glycemic control– Group A with Hb_{1c} 8.6–9.7%, group B with Hb_{1c} 9.7–10.7 %, and group C with Hb_{1c} 10.8–12.7%. In all the groups, patients were advised Yoga practice for 90 minutes daily for three months under supervision. Biochemical assessment of HbA_{1c}, blood glucose, lipid profile, cortisol, ferritin, malondialdehyde, and catalyse activity were carried out initially and after 90 days found improvement at a statistically significant level.

25. A study by **Furtado G E, *et al*..**(2016) titled Effects of a Chair-Yoga exercises on stress hormone levels, daily life activities, falls and physical fitness in institutionalized older adults was conducted in 35 female participants (20 study group + 15 control group). Chair Yoga was practiced for twice a week for 14 weeks. The study results showed improvement in physical fitness and reduction in stress hormones, mainly cortisol and α- amylase, in the study group when compared to the control group.[xxv]

26. The study by **Nick Narjes, *et al*..**(2016) titled The effect of Yoga on balance and fear of falling in older adults RCT [Study group (Yoga Intervention) and Control group (No Yoga intervention)] was conducted to determine the effect of falling on older adults. 40 subjects in the age group 60–74 years were recruited for the study. Pre- and post-Yoga therapy Modified Falls Efficacy Scale (MFES) score and Berg Balance Scale (BBS) score data were recorded. After the 8-week Yoga program, the analysed pre- and post-data showed significant changes in both the variables – MFES and BBS–as compared to the Control group. The result suggests that Yoga may be used to reduce the fear of falling and improve balance in older adults. xxvi

27. A systematic review and meta analysis have been done by Cramer, Holger, et al..(2014) in their study titled Effects of Yoga on cardiovascular disease risk factors: a systematic review and meta-analysis. In this work, 44 RCTs with a total of 3168 samples were included; the samples were predefined cardio-vascular or non-diabetic with a high risk of cardio-vascular diseases or participants with diabetes mellitus type 2. The pre- and post-therapy analysis of the participants showed a significant difference as compared to the control group. Yoga intervention improved anthropometric parameters, lipid profile, and cardio-vascular parameters like blood pressure and heart rate. This meta-analysis reveals evidence that Yoga can be beneficial in cardiovascular risk factors.

28. **Mittal, Karuna, *et al*..** (2016) studied the *Effect of mind body therapy (Yoga, meditation & music) on elderly hypertensive people*. 100 elderly hypertensive patients (ages of> 60 years) were recruited for the study and divided into two groups randomly. Baseline data of body mass index (BMI), waist-

to-hip ratio, fasting blood sugar, blood pressure, lipid profile (TC, TG, HDL-C, LDL-C) were recorded. Blood pressure data were recorded weekly in a regular manner. After MBT therapy for three months continuously (minimum five times a week), the post-therapy data were recorded and analysed. Results showed significant change when comparing in between the 2 groups ($p<0.01$). A highly significant difference was observed in blood pressure, fasting blood glucose, changes in lipid profile like HDL, LDL, and VLDL. It indicates Yoga can be used as adjunctive therapy in the management of hypertension.

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12 YOGA PRACTICES FOR HEALTHY LIVING (GERIATRIC POPULATION)

1. Prayer

ॐ सह नाववतु ।
सह नौ भुनक्तु ।
सह वीर्यं करवावहै ।
तेजस्वि नावधीतमस्तु मा विद्विषावहै ।
ॐ शान्तिः शान्तिः शान्तिः ॥

Om Saha Nau-Avatu |
Saha Nau Bhunaktu |
Saha Viiryam Karavaavahai |
Tejasvi Nau-Adhiitam-Astu Maa Vidvissaavahai |
Om Shaantih Shaantih Shaantih ||

Meaning:
Aum! May He protect us both together; may He nourish us both together;
May we work conjointly with great energy,
May our study be vigorous and effective;
May we not mutually dispute (or may we not hate any).
Aum! Let there be peace in me!
Let there be peace in my environment!
Let there be peace in the forces that act on me!

2. *Yogic Sukshma Vyayama* (Micro circulation practice):

a) Neck movements:

i. Forward and Backward Bending:

- Stand with the feet 2-3 inches apart.
- Keep the hands straight beside the body.
- This is *Samasthiti*. This is also called *Tadasana*.
- Keep your palms on the waist.
- While exhaling, move the head forward slowly and try to touch the chin to the chest.
- While inhaling, move the head up and bend back comfortably.
- This is one round: repeat two more rounds.

Precaution

- People with problem of cervical spondylosis, vertigo can practice this gently and in sitting position.

ii. Right and Left Lateral Bending:

- While exhaling, bend the head slowly to the right; bring the ear as close as possible to the shoulder without raising the shoulder.
- While inhaling, bring the head to the normal position.
- Similarly, while exhaling, bend the head to the left side.
- Inhale and bring the head up to normal position.
- This is one round: repeat two more rounds.

Precaution

- People with problem of cervical spondylosis, vertigo can practice this gently and in sitting position.

iii. Right and left Twisting

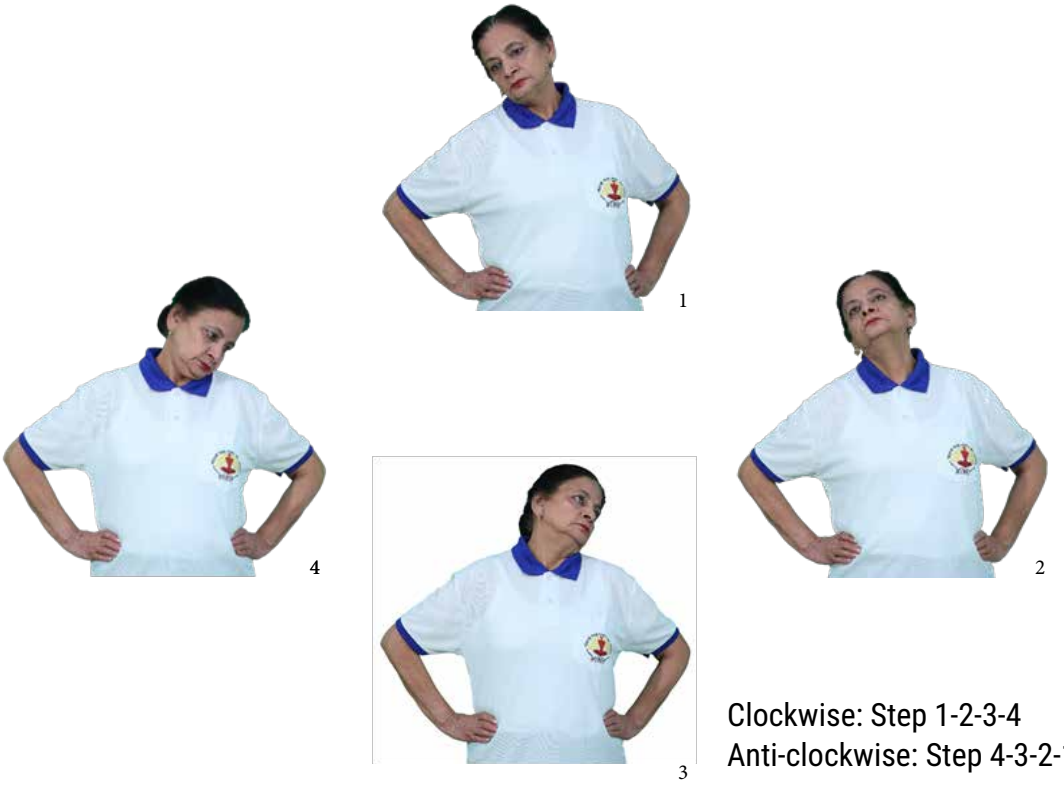
- Keep the head upright.
- While exhaling, gently turn the head to the right so that the chin is in line with the shoulder.
- While inhaling, bring the head to the normal position.
- Similarly, while exhaling, turn the head to the left.
- Inhale and bring the head to the normal position.
- This is one round: repeat two more rounds.

Precaution

- People with problem of cervical spondylosis, vertigo can practice this gently and in sitting position.

iv) Neck rotation (clockwise and anti-clockwise)

- Keep the head upright.
- Exhale; bend the head forward and try to touch the chin to the chest.
- Inhale; slowly rotate the head clockwise in a circular motion; exhale while coming down.
- Do a full rotation.
- Then, rotate the head in the anti-clockwise direction.
- Inhale; slowly rotate the head anti-clockwise in a circular motion; exhale while coming down.
- This is one round: repeat two more rounds.
- Come back & relax.



Clockwise: Step 1-2-3-4
Anti-clockwise: Step 4-3-2-1

Precautions

- Move the head as far as possible. Do not over-strain.
- Keep the shoulders relaxed and steady.
- Feel the stretch around the neck and loosening up of the joints and muscles of the neck.
- This can be practised sitting on a chair.
- People with neck pain can do the practice gently, especially when taking the head back to the extent, if it is comfortable.
- Elderly people and persons with severe cervical spondylosis, vertigo and high blood pressure may avoid these practices.

b) Shoulder Movements

i. Shoulder stretch

- Keep the feet together, the body straight, and arms by the sides.
- While inhaling, slowly raise both arms sideways above the head with the palm outwards. Bring them down in the same manner.
- The arms must not touch the head when going up or the thighs when coming down.Palms must be opened, with fingers together.
- This is one round; repeat two more rounds.

Shoulder Rotation (forward and backward)

- Stand erect.
- Keep the feet together, the body straight, and the arms by the sides.
- While inhaling, slowly raise both arms sideways up to shoulder level.

Step 1

Step 2

Step 3

Step 4

Step 5

- Turn the palms upwards and bending the elbows, place the fingers of the left hand on the left shoulder and the fingers of the right hand on the right shoulder.
- Full rotation of the elbows in a circular manner.
- Inhale and raise the elbows, and bring them back while exhaling.
- Try to touch the elbows in front of the chest on the forward movement, stretch the elbows back in the backward movement and touch the side of the trunk while coming down.
- Do the same in a reverse manner. Inhale while raising the elbows and exhale while bringing them down.
- This is one round; repeat two more rounds.
- Come back & relax.

Benefits

✓ The practice of this *Kriya* makes the bones, muscles, and nerves of the neck and shoulder region healthy.

✓ These practices are helpful in cervical spondylosis and frozen shoulder.

c) Trunk movement

i. Trunk twisting (*Kati Shakti Vikasaka*)

- Keep the legs shoulder width apart.
- Raise both arms up to shoulder level with palms facing each other and in parallel.
- While exhaling, twist the body towards the left side so that the right palm touches the left shoulder; come back with inhalation.
- While exhaling, twist the body towards the right side so that the left palm touches the right shoulder; come back with inhalation.
- This is one round: repeat two more rounds.
- Come back and relax.

Precautions

✓ Do slowly with normal breathing.

✓ Cardiac patients shall do with care.

✓ Avoid this practice in case of severe back pain, vertebral and disc disorders, after abdominal surgery, and during menstruation.

d) Knee Movement

- Keep the legs shoulder width apart.
- Inhale; lift your arms upto the shoulder level, palms facing downwards.
- Exhale; bend the knees and bring down the body to the semi-squatting position.
- In the final position, both the arms and thighs should be parallel to the ground.
- Inhale, and straighten the body.
- Exhale while bringing down the hands.
- Repeat two more times.
- Come back and relax.

Variation

✓ One can practice the same with the support of chair.

Benefit

✓ It helps to strengthen the knees and hip joints.

Precaution

✓ Avoid this practice in case of acute conditions of arthritis.

e) Ankle Movement

Ankle stretch

Technique

- Stand straight with the feet few inches apart.
- Stretch one foot forward and hold it about 9 inches off the ground; move the foot up and down, then right and left.
- Repeat with the other foot.
- Repeat two more times.

Variation

✓ One can practice the same while sitting on the chair.

Ankle rotation

Technique

- Stand straight with the feet few inches apart.
- Lift your right foot up at 9 inches off the ground.
- Slowly rotate the right foot in clockwise and anti-clockwise direction.
- Repeat two more times.
- Repeat the same with the other foot.

Variation

✓ One can practice the same while sitting on the chair or in a long sitting position, or standing with wall support.

Benefit

- This practice relieves stiffnessin ankles and strengthen the toes and the feet.

Precaution

✓ Avoid this practice in case of acute conditions of arthritis.

3. *Yogic Sthula Vyayama*

i) *Rekhagati (Walking in a straight line)*

Rekhagati

Technique

- Stand straight with the feet few inches apart.
- With the left foot on the ground, place your right foot in front of it so that the right heel touches the toes of the left foot.
- Now walk 50 steps ahead with the heel of one foot touching the toes of the other, taking care to see that the entire distance is covered in a straight line.
- Then walk backwards in the same manner and in straight line.
- Keep your chin parallel to the ground and gaze at any point in front of you (a person should not look at their feet while walking).
- This practice increases the power of concentration and improves the balance of the body.

Variation

✓ Initially, one can practice the same with wall support.

ii. *Urdhva-gati* (Upward movement)

Technique

- Stand straight with the feet few inches apart.
- With feet one foot apart, hold one arm bent at the elbow at an angle of 90 degrees while the other is stretched straight upwards.
- The palms of both hands must remain open, facing forward with fingers together.
- Bend your left knee and stretch your right arm upwards. Breathe in and out to synchronise with the movement of your limbs. Repeat this process with the right foot and left arm raised.
- Start by repeating ten times. This practice is good for the limbs and circulation.

Urdhva-gati

Surya Namaskara (at slow pace)

The ideal time to practice *Surya Namaskara* is at sunrise, the most peaceful time of day. Whenever possible, practice in the open air, facing the rising sun. Sunset is also a good time to practice as it stimulates the digestive fire. *Surya Namaskara*, however, may be practiced at any time provided the stomach is empty.

Surya Namaskara consists of 12 positions as given below.

Pranamasana

Position 1: *Pranamasana* (Prayer pose): Stand with the feet together or slightly apart, and the arms hanging loosely by the side of the body. Inhale, close the eyes gently and become aware of the whole physical body as one homogeneous unit. In this position, the body may sway from side to side or backward and forward. Try to minimise this oscillation and balance the body weight equally on both feet. Exhale, slowly bend the elbows and place the palms together in front of the chest in *Namaskara Mudra*, mentally offering homage to the sun, the source of all life. The awareness may be kept on the chest area.

Position 2: *Hasta Uttanasana* (Raised arms pose): Inhale, raise and stretch both arms above the head. Keep the arms separated, shoulder width apart. Bend the head, arms, and upper trunk backwards. The awareness may be kept on the stretch of the abdomen and expansion of the lungs.

Hasta Uttanasana

Padahastasana

Position 3: *Padahastasana* (Hand-to-foot pose): Exhale, bend forward until the fingers or palms of the hands touch the floor on either side of the feet. Try to touch the knees with the forehead. Do not strain. Keep the knees straight. The awareness may be kept on the pelvic region.

Position 4: *Ashwa Sanchalanasana* (Equestrian pose): Inhale, place the palms of the hands flat on the floor beside the feet. Stretch the right leg back as far as possible. At the same time, bend the left knee, keeping the left foot on the floor in the same position. Keep the arms straight. In the final position, the weight of the body should be supported on the hands, the left foot, right knee, and toes of the right foot. The head should be tilted backwards, the back arched, and the inner gaze directed upward to the eyebrow centre. The awareness may be kept on the stretch from the thigh to the chest or on the eyebrow centre.

Ashwasanchalanasana

Parvatasana

Position 5: *Parvatasana* (Mountain pose): Exhale, take the left foot back beside the right foot. Simultaneously, raise the buttocks and lower the head between the arms, so that the back and legs form two sides of a triangle. The legs and arms should be straight in the final position. Try to keep the heels on the floor in the final pose and bring the head towards the knees. Do not strain. The awareness may be kept on relaxing the hips or on the throat region.

Ashtanga Namaskarasana

Position 6: *Ashtanga Namaskara* (Salute with eight parts or points): Lower the knees, chest, and chin to the floor. In the final position, only the toes, knees, chest, hands, and chin touch the floor. The knees, chest, and chin should touch the floor simultaneously. If this is not possible, while inhaling, first lower the knees, then while exhaling the chest in between the palms , and finally the chin. The buttocks, hips, and abdomen should be raised. The awareness may be kept on the abdominal region.

Position 7: *Bhujangasana* (Cobra pose): Inhale, lower the buttocks and hips to the floor, straightening the elbows, arch the back and push the chest forward into the cobra pose. Bend the head back and direct the gaze upward to the eyebrow centre. The thighs and hips remain on the floor and the arms support the trunk. Unless the spine is very flexible, the arms will remain slightly bent. The awareness may be kept on relaxation of the spine.

Bhujangasana

Parvatasana

Position 8: *Parvatasana* (Mountain pose):

From Bhujangasana, assume Parvatasana. Keep the arms and legs straight, grip the floor with the toes and use the strength of the arms to raise the buttocks while exhaling and lower the heels to the floor. The awareness may be kept on relaxing the hips or throat region.

Position 9: *Ashwa Sanchalanasana* (Equestrian pose):

Keep the palms flat on the floor and the left foot in place. Bend the right leg and bring the right foot forward between the hands. Simultaneously, lower the left knee so that it touches the floor and push the pelvis forward. Inhale, tilt the head backward, arch the back and gaze at the eyebrow centre. The awareness may be kept on the stretch from the front of thigh and the eyebrow centre.

Ashwa Sanchalanasana

Position 10: *Padahastasana* (Hand-to-foot pose):

While exhaling bring the left foot forward next to the right foot. Straighten both legs. Bring the forehead as close to the knees as possible without straining. The awareness may be kept on the pelvic region.

Padahastasana

Hasta Uttanasana

Position 11: *Hasta Uttanasana* (Raised arms pose):

Keep the arms and spine in a straight line. Raise the torso and stretch the arms above the head while inhaling. Keep the arms separated, shoulder width apart. Bend the head, arms and upper trunk backward slightly. The awareness may be kept on the stretch of the abdomen and expansion of the lungs.

Position 12: *Pranamasana* (Prayer pose):

Exhale, bring the palms together in front of the chest. The awareness may be kept on the chest area.

Benefits: *Surya Namaskara* is a complete *Sadhana* (spiritual practice) in itself for it includes *Asana*, *Pranayama*, *Mantra*, and meditation techniques. It stimulates all the systems of the body, including the reproductive, circulatory, respiratory, and digestive systems. Its influence on the endocrine glands . *Surya Namaskara* makes the practitioner physically fit, mentally alert, and emotionally balanced by bringing fresh, oxygenated blood, to the brain.

Precaution: People suffering from high blood pressure, coronary artery disease, stroke, hernia should not practise *Surya Namaskara*.

Pranamasana

Tadasana

4. *Yogasanas*

A. Standing Postures:

Tadasana (Palm Tree Posture)

Tadasana is named after '*Tada*' (Palm tree). In the final posture, the body remains erect in standing position like a palm tree.

Technique

- Stand straight on the ground with feet comfortably apart .
- Inhale, lift your arms up to the shoulder level in the front.
- Interlock the fingers, and turn the wrist outwards. Now inhale; raise the arms up above your head.
- Raise your heels to stand on toes (if comfortable), stretch the whole body upward from toes to fingers.
- Maintain this posture with normal breathing or hold the breath for a while.
- While exhaling, slowly bring the arms down along with the body.
- Relax for a while in standing position.

Variation

- One can practise the same without lifting the heels.

Benefits

- This *Asana* stretches the muscles and the nerves, thereby improves the functioning of various systems of the body.
- It gives strength to toes.
- It is helpful for the patients of sciatica.

Precaution

- This *Asana* should be done under supervision.

Utkatasana (Static practice)

'*Utkata*' means 'powerful' or 'fierce'. Performing this *Asana* requires balancing.

Technique

- Keep the legs shoulder width apart.
- Raise both the arms up from the front and bring them to the shoulder level.
- While exhaling, bend knees till you are comfortable or till thighs are parallel to the floor.
- Keep the heels on floor and extend the chest upward.
- Look in front. Hold this position with normal breathing.
- While returning, inhale; straighten the legs and bring the hands down.

Utkatasana*

*:- Modified version of the *Asana*

Variation

- One can practise the same with the support of chair.

Benefits

- It strengthens toes, thighs, knees, and calf muscles.
- It improves the functioning of the digestive system.
- It is a useful remedy for arthritic disorder.

Precaution

- Practice of this *Asana* should be avoided in case of severe arthritis, vertigo, and ankle injuries.

Urdhva Hastottanasana (Up-stretched Arms Posture)

'*Hasta*' means arms and '*Uttana*' means stretched up. In this *Asana*, arms are stretched upward. Therefore, the *Asana* is named *Hastottanasana*.

Urdhva Hastottanasana

Technique

- Stand on the ground with feet comfortably apart.
- Inhale and raise arms over the head. Interlock the fingers.
- While exhaling, bend to the left side from the waist.
- Hold the position for a while and while inhaling come back to the centre.
- Repeat the practice on the right side.

Benefits

- It exercises the back, neck, and spinal joints.
- It improves the flexibility of the spine.
- It makes the waist slim, the chest broad; removes fatty deposits on hips and the buttocks.
- It relieves constipation.

Precaution

- Avoid in case of vertigo.

Kati Chakrasana

Kati Chakrasana (Lumbar-Twist Posture)

'*Kati*' means waist and '*Chakra*' means wheel. In this *Asana*, one has to twist the waist to right and left sides. While doing so, the waist moves like a wheel, therefore it is named as *Kati Chakrasana*.

Technique

- Stand firmly on the ground with feet 12 inches apart.
- Now, keep the arms out-stretched in front of the chest with palms facing each other.
- Swing the arms slowly towards right side of your body.
- Twist your body from the waist and try to take your arms back as far as possible.

- While swinging towards the right side, the right arm should be kept straight and the left arm should be bent.
- Repeat the practice on the left side as well.

Benefits

- The waist becomes slim and supple; and chest expands.
- It relieves constipation and makes the lumbar region strong.
- The ribs become resilient, thereby many respiratory ailments, even tuberculosis of lungs can be prevented.
- It strengthens shoulders, neck, arms, abdomen, back, and thighs.

Trikonasana

Trikonasana (Triangle Posture)

'*Trikona*' means triangle. In this *Asana*, the body assumes the shape of a triangle, hence it is named *Trikonasana*.

Technique

- Stand erect with legs comfortably together, hands by the side of thighs.
- Then move your legs 2–3 feet apart and spread arms at the shoulder level.
- Now exhale slowly; gradually, bend your body towards your right side as much as possible or place the right hand just behind the right foot.
- Try not to bend your knees.
- In the final position, left arm straight in line with right arm. Turn the left palm forward.
- Turn your head and gaze at the tip of the left middle finger.
- Maintain the final posture with normal breathing.
- While inhaling, slowly come back to normal position.
- Repeat the same practice on the other side.

Benefits

- The practice of this *Asana* relieves backache and strengthens the buttocks.
- The body becomes light. The ailment of the lungs and frequent boils and pimples on the skin are managed by this practice.
- This *Asana* proves beneficial for the patients of sciatica, if practiced slowly.

Precaution

- The practice of this *Asana* should be avoided during severe backache.
- Bend as per your capacity.
- One can take support of a block or wall.
- Don't turn your face towards the ceiling in the final pose in case of cervical spondylosis.
- Avoid this practice in case of vertigo.

B. Supine Lying Postures

Pawanamuktasana (Anti-flatus Posture)

'*Pawana*' means wind and '*Mukta*' means released. As the name suggests, the practice of this *Asana* helps in releasing excessive gas from the body. This *Asana* when performed with one leg is called *Ekapada Pawanamuktasana*.

Pawanamuktasana*

Technique

- Lie flat on your back. Stretch out both the legs.
- While inhaling, lift both legs, bend them at the knees and encircle the knees with both arms. While exhaling, press the knees and bring them towards the chest, without raising the head.
- This is *Pawanamuktasana*.

Variation

- One can practise the same with one leg at a time, keeping the other leg straight.
- One with knee pain can encircle their arms around the thighs below your calf muscle.

Benefits

- The practice of this *Asana* helps in eliminating toxic gases from abdomen.
- This *Asana* relieves constipation and the feeling of heaviness in the stomach.
- Extra fat in the abdominal area is dissolved.
- The spine becomes strong and flexible.
- It is good for the lungs and the heart.

Precaution

- Never practice it soon after taking the meal.
- Avoid lifting head in case of cervical spondylosis or upper back stiffness

Sarala Matsyasana

Sarala Matsyasana (Fish Posture)

In Sanskrit, '*Matsya*' means fish. In the final position of this *Asana*, the body takes the shape of a fish; hence the *Asana* is known as *Matsyasana*.

Technique

- Lie on your back.
- Lift the upper back with the support of elbows and palms and try to place the crown of your head on the ground.
- The legs should be straight, and the back should be arched to the extent that the body is supported on the head and the elbows.
- Maintain the final posture.

* :- Modified version of the *Asana*

- While returning, place palms on the ground;
- Straighten the head with the help of hands and come up slowly.
- Relax in *Shavasana*.

Benefits

- *Saral Matsyasana* gives an excellent massage to the abdominal organs and manages constipation.
- It is effective in the treatment of throat diseases.
- It expands the chest and is useful in lung and respiratory disorders.
- It relaxes the muscles of the upper back and makes the spine resilient.
- It is beneficial in cases of back pain.
- It is helpful for ladies to prevent and curing various forms of sexual malfunctioning.
- It is good for women suffering from uterus problems and diabetes.

Precaution

People who are suffering from peptic ulcer, hernia or any serious spinal ailments should not do this *Asana* without expert advice.

Viparitakarani (Shoulder Stand Posture)

According to Sanskrit, '*Viparita*' means 'reverse' and '*Karani*' means 'by which'. In this *Asana*, the legs are raised upward in a lying position.

Viparitakarani

Technique

- Lie in a relaxed supine position with legs together.
- Raise the legs, keeping them straight.
- Push down on the arms and hands and raise the buttock.
- Support the lower back with hands, keeping elbows on the floor.
- Remain steady for some time.

Benefits

- Its regular practice improves digestion, stimulates appetite, and helps in relieving constipation.
- This practice improves blood circulation to the brain and increases mental alertness.
- It brings lustre to the skin and helps in preventing hair fall.
- It balances the functioning of the thyroid and helps in alleviating the problems caused by hypoactive thyroid.

Precaution

- People suffering from high blood pressure, heart diseases, enlarged thyroid, vertigo and cervical spondylosis should not perform this practice.

Setubandhasana (Bridge Posture)

'*Setubandha*' means formation of bridge. The body, in this posture, is positioned like a bridge. Hence, it is called *Setubandhasana*.

Setubandhasana*

Technique

- Lie down in a relaxed supine position with legs together.
- Bend both legs at the knees and bring the heels near the buttocks.
- Keep the knees and feet in one straight line and palms beside your thighs.
- Inhale, slowly raise your buttocks and trunk as much as to form a bridge.
- Remain in this position for few seconds, with normal breathing.
- Exhale, slowly return to the original position and relax in *Shavasana*.

Benefits

- It removes strain on the back and neck.
- It stretches and massages the colon and other abdominal organs.
- It tones female reproductive organs.

Shavasana (Corpse Posture)

In Sanskrit, '*Shava*' means 'dead body'. The posture is called *Shavasana* as the body in this *Asana* resembles a dead body.

Technique

- Lie down on the back with the hands comfortably away from the body.
- Make a distance of one to two feet between the feet with toes pointing outward.
- Place both the hands on the ground, 10 inches away from the body with fingers in a semi-flexed position and palms facing upwards.
- Keep the head in a most convenient position.

Savasana

- Gently close the eyes; breathe normally or practice moderately deep abdominal breathing.
- Attend to the flow of the breath without moving the body.
- Try to relax all parts of the body by diffusing the tension in each part of the body.

Benefits

- It helps to reduce stress and removes physical and mental fatigue.
- It relaxes all muscles and nerves of the body.
- It is helpful to overcome psychological disorders.
- It is beneficial for managing high blood pressure, cardiac diseases, and anxiety disorders.

* :- Modified version of the *Asana*

C. Prone Lying Postures

Bhujangasana (Cobra Posture)

'*Bhujanga*' means cobra. The final position of this *Asana* resembles the shape of a cobra.

Technique

- Lie down on the stomach with legs together, toes pointing outwards, hands by the sides of the thighs, palm facing upward and forehead resting on the ground.
- Fold hands at the elbows,place palms on the ground, below or sides of the shoulder, thumbs should be under the armpit.

Bhujangasana

- Bring the chin forward and place it on the ground, gaze in front.
- As you inhale slowly, lift the head and chest up to the navel region without changing the position of hands.
- Stay there comfortably for few breaths.
- This is called *Bhujangasana*.
- Now, come back and place your forehead on the ground and relax in '*Makarasana*'.

Variation

- One can practise the same posture with forearms on the floor.

Benefits

- This posture strengthens the muscles of the back.
- It is beneficial for relieving flatulence.
- It can relocate slipped disc, removes backache, and keeps spine supple and healthy.
- It tones the ovaries and uterus, and helps alleviate menstrual and other gynaecological disorders.

Precaution

- It is strictly prohibited for patients with hernia, recent abdominal surgery and abdominal injuries.

Makarasana (Crocodile Posture)

In Sanskrit, '*Makara*' means crocodile. In this *Asana*, the body resembles a crocodile.

Makarasana

Technique

- Take prone lying position, with chin, chest and abdomen touching the ground.
- Spread the legs little apart and place them comfortably on the ground in such a position that the heels face each other and toes point outward.

- Take the hands one by one beneath the head; grasp the hands with each other lightly forming a triangle. Now place the forehead on the hands and dip the face into the space.
- Slowly close eyes and relax. Do normal breathing and remain in this position as long as comfortable.

Benefits

- It is good for asthma, dyspepsia and vata diseases.
- It is helpful in keeping the spine flexible.
- Removes mental and physical fatigue.

Dhanurasana (Bow Posture)

In Sanskrit, '*Dhanu*' means bow. In the final pose of this *Asana*, the body takes the shape of a bow; hence the *Asana* is named as *Dhanurasana*.

Dhanurasana

Technique

- Lie down in a prone position. While exhaling, bend the knees and hold the ankles with hands.
- While inhaling, raise the thighs, head, and chest as high as possible.
- Try to maintain the weight of the body on the lower abdomen. Join the ankles if possible. Look upward and breathe normally.
- Maintain this position for some time, and while exhaling slowly come back to the original position.

Benefits

- *Dhanurasana* decongests the entire abdominal region, and its organs.
- The liver and pancreas are massaged in this *Asana*. It is, therefore, useful in diabetes mellitus.
- The back's ligaments, muscles, and nerves are given good stretch and the spinal column is rejuvenated. It is beneficial for treating back pain.
- It helps to alleviate constipation, dyspepsia, and sluggishness of the liver.
- It straightens the hunched back and drooping shoulders.
- It helps restore the displaced navel to its normal position.
- It regulates the digestive, excretory, and reproductive organs in the body.
- It is helpful in the treatment of chest ailments.
- It stimulates and regulates the thyroid and adrenal glands.

Precaution

- People suffering from hernia, peptic ulcer or duodenal ulcer, appendicitis, colitis, and high blood pressure should consult a Yoga expert before practising this *Asana*.

D. Sitting Postures

Vakrasana (Twisting Posture)

'*Vakra*' means twisted. In this *Asana*, spine is twisted, hence the name. This *Asana* gives rejuvenating effects on the functioning of spine.

Technique

- Sit on the ground with legs stretched out.
- Bend the right leg at the knee and place the foot beside the left knee.
- Keep the spine straight and twist the waist towards the right as you exhale.

Vakrasana

- Try to bring the left arm towards the right-side foot in such a way that the outer side of the left arm touches the outer side of the right leg; and place the left hand beside the right foot or bend your left elbow and try to push your right knee with the left elbow while trying to twist spine to your right.
- Take the right arm back and keep the palm on the ground in such a way that the trunk is kept erect with a proper twist.
- Repeat on the opposite side.

Variation

- While twisting, one can grab the knee or push the knee towards the chest.

Benefits

- This *Asana* makes spinal bone flexible and tones up spinal nerves.
- It is helpful in cases of constipation and dyspepsia.
- It stimulates the pancreas and is helpful for diabetes.
- It improves the capacity of the lungs.

Ardhamatsyendrasana (Half Matsyendra Posture)

Ardhamatsyendrasana is named after the great Yogi Matsyendranatha. Full version of this *Asana* is difficult for a beginner to master. Therefore, a modified version of *Ardhamatsyendrasana* is explained here.

Technique

- Sit straight with stretching your legs in front of you.
- Bend your left knee and try to touch your left foot to your right buttock.
- Bring your right foot outside the left knee. Touch your sole of right foot to the ground. Keep your spine erect.

Ardhamatsyendrasana

- Exhale and turn your upper body to the right. Hold your right foot with left hand and wrap your right hand behind the back.
- Breathe normally and hold this posture for few seconds.
- Now release this posture and repeat it on the other side.

Variation

- Instead of wrapping your hand behind the back, one can place their palm on the floor in the line of spine.

Benefits

- This *Asana* is beneficial for adrenal glands, kidneys, liver, and spleen.
- It helps to relieve constipation, asthma, indigestion, and obesity.
- It strengthens muscles of the spine and back and makes them flexible.
- It corrects stooping shoulders, and a bad posture.
- It stretches and strengthens shoulders, hips, and neck.
- It is good for diabetic patients.

Precaution

- Those suffering from stiffness in the spine should practise it carefully.

Ardha Ushtrasana

Ardha Ushtrasana (The Half-Camel Posture)

"*Ushtra*" means 'camel'. The final version of this *Asana* resemble the hump of a camel. Only the first stage (half) of the *Asana* is being practised in *Ardha Ushtrasana*.

Technique

- Sit in *Vajrasana*.
- Stand on your knees.
- Place the hands on the hips with fingers pointing downwards.
- Keep the elbows and shoulders parallel.
- Inhale, bend the head back and stretch the neck muscle; exhale and bend the trunk backwards as much as possible.
- Keep the thighs perpendicular to the ground.
- Remain in the posture for few seconds with normal breathing.
- Return with inhalation; sit in *Vajrasana*.

Benefits

- This *Asana* strengthens the back and neck muscles.
- It relieves constipation and back pain.

Precaution

- Avoid doing this *Asana* in case of hernia and abdominal injuries, arthritis, and vertigo.

Ushtrasana

Ushtrasana (Camel Posture)

'*Ushtra*' means camel. The body in this posture resembles the posture of a camel, hence the name.

Technique

- Sit in *Vajrasana*.
- Bring the knees and the feet a few inches apart and stand on your knees. While inhaling, bend backwards with the right palm on the right heel and the left palm on the left heel; exhale.
- Be careful not to jerk the neck while bending backwards.
- In the final position, the thighs will be vertical to the floor, and the head tilted backwards.
- The weight of the body should be evenly distributed on the arms and legs.
- Remain in the posture for few seconds with normal breathing.
- Return with inhalation; sit in *Vajrasana*.

Variation

- One can practise the same with toes tucked inside.

Benefits

- *Ushtrasana* is extremely useful for defective eyesight.
- This is useful in back pain and neck pain.
- It helps to reduce fat over the abdomen.
- It is helpful for digestive problems.

Precaution

- Those suffering from high blood pressure, heart disease, vertigo and hernia should not practise it.

Janu Shirsasana (Head to knee pose)

In Sanskrit, '*Janu*' means the knee, '*Shirsa*' is the head. In this posture, sit with one leg stretched out on the ground and the other bent at the knee. Then catch the extended foot with both the hands and place the head on that knee.

Janu Shirsasana

Technique

- Sit in *Dandasana*.
- Bend your right knee and place the sole of your right foot touching your left inner thigh.

- Inhale, raise the arms upwards;
- Exhale, bend at your hips, lean over your left leg and grasp your left toe.
- Bend your trunk further forward with further exhalation and try to place your forehead on your knee.
- Maintain in the final position for few seconds.
- Inhale and lift your head & chest. Straighten your right leg, and come back to *Dandasana*.
- Repeat it on the other side.

Benefits

- It strengthens abdominal muscles. It reduces the possibility of sciatica.
- It is helpful in removing constipation, obesity, dyspepsia, seminal weakness, and skin diseases.

Precaution

- Those suffering from ulcers in the abdomen, hernia, or recent abdominal or heart surgery should not practise it.

Pashchimottanasana (Posterior-Stretch Posture)

'*Pashchima*' means posterior and '*Uttana*' means stretch out. In this *Asana*, the back side of the body including the spinal column gets stretched, hence it is called *Pashchimottanasana*. Stretching both the legs straight on the ground and holding the big toes with hands, one should stay in this position with one's forehead placed on one's knees. This is called *Pashchimottanasana*.

Pashchimottanasana

Technique

- Sit on the ground, stretching both the legs in front. Place hands by the sides with palms resting on the ground. Fingers should remain together pointing forward.
- Loosen your back muscles and bend the body forward as far as possible.
- Maintain this pose for as long as comfortable.
- To come back, loosen your hands and place them where they are comfortable. It would be easier if they are put on the thighs.
- Practice this *Asana* daily and keep trying forward bending little more till you are able to hold big toes of the legs with forefingers of respective hands. The navel should be touching the thighs.
- Bring chest and head close to the legs as much as possible; and place the elbows by the side of the legs on the ground.
- Maintain the posture as per one's capacity. Come back by raising chest and head from the legs.

Benefits

- It strengthens abdominal muscles. It reduces the possibilities of sciatica.
- It is helpful in removing constipation, obesity, dyspepsia, seminal weakness, and skin diseases.
- Those practicing it for more than three minutes should practice *Uddiyana Bandha* in the middle of the *Asana*.

Precaution

- Those suffering from ulcer in abdomen should not practice it.

Uttanamandukasana (Stretched-up Frog Posture)

'*Uttana*' means upright and '*Manduka*' means frog. The final position of *Uttanamandukasana* resembles an upright frog, hence the name. In *Mandukasana*, the head is held by the elbows.

Uttanamandukasana

Technique

- Sit in *Vajrasana*.
- Spread both the knees wide apart while toes remaining together.
- Raise your right arm, fold it, and take it backward from above the right shoulder and try to place the palm below the left shoulder.
- Now, fold the left arm similarly and try to place the palm from below the right shoulder.
- Maintain the position, while coming back, slowly remove the left arm and then the right arm; bring the knees together as in the initial position.

Benefits

- This *Asana* is helpful in backache and throat pain.
- It helps in improving the diaphragmatic movements.

Precuation

- Those suffering from knee or ankle pain or injury should avoid bending knees. They can practice this *Asana* while sitting on chair or in *Sukhasana*.

5. *Kapalabhati*

Kapalabhati is a *Kriya* (cleansing practice) for cleansing the frontal brain. '*Kapala*' means '*skull*', and '*Bhati*' means 'shine'.

Kapalabhati

Technique

- Sit in any meditative posture.
- Close the eyes and relax the whole body
- Inhale deeply through both nostrils, expand the chest.
- Expel the breath with forceful contractions of the abdominal muscles and relax.
- Do not strain.
- Continue active/forceful exhalation and passive inhalation.
- Complete 10-20 rapid breaths, then take a deep breath and exhale slowly.
- This is one round of *Kapalabhati*.
- Each round shall be followed by deep breathing. Repeat 2 more rounds.

Breathing:

- Forceful exhalation by contracting the abdominal muscles, without any undue movements in the chest and shoulder region. Inhalation should be passive throughout the practice.

- Number of rounds: Beginners can practice up to 3 rounds of 10 strokes each. The count and rounds can be increased gradually over a period of time.

Benefits

- *Kapalabhati* purifies the frontal air sinuses; helps to overcome cough disorders.
- It is useful in treating cold, rhinitis, sinusitis, asthma,and bronchial infections.
- It rejuvenates the whole body, and keeps the face young and vibrant.
- It balances and strengthens the nervous system and tones up the digestive system.

Precautions

- Please avoid this practice in case of cardiac conditions, giddiness, high blood pressure, vertigo, chronic bleeding in the nose, epilepsy, migraine, stroke, hernia and gastric ulcers.

6. *Pranayama*

Ujjayi Pranayama

This *Pranayama* is performed with both nostrils, but for rechaka, the left nostril is used. *Hatha Yoga Pradipika* (H.P)(2/51-52) explains "by closing the mouth, one should slowly draw in air through both the nostrils, producing a sound so that breath is felt from the throat to the chest. After performing *Kumbhaka* as before, the air is exhaled through the left nostril. This removes throat diseases caused by phlegm and increases gastric fire."

Ujjayi Pranayama

Technique

- Sit in *Padmasana* or *Sukhasana*.
- Close the mouth. Contract the region at the back of the throat, inhale slowly through both nostrils in a smooth and uniform manner till the breath fills the space from the throat to the heart.During inhalation, a peculiar sound is produced owing to the partial closing of the glottis. This sound should be of mild and uniform pitch. It should be continuous also.
- Expand the chest while inhaling.
- Retain the breath for as long as one can do it comfortably.
- Then exhale slowly through the left nostril by closing the right nostril with the right thumb.
- Instead of exhaling through the left nostril, one can slowly exhale through both the nostrils.

Benefits

- It increases digestive fire (*Hatha Yoga Pradipika* 2/52). It removes disorders of the *Nadi* and the *Dhatu*; and prevents *Jalodara* (dropsy of the belly) (*Hatha Yoga Pradipika* 2/53).
- It removes phlegm from the throat and prevents all sorts of pulmonary diseases (*Hatha Yoga Pradipika* 2/53).
- It prevents diseases caused by deficient inhalation of oxygen and cardiac diseases.
- Regular practice of this *Pranayama* defends the practitioner from diseases of phlegm, degeneration, dyspepsia, dysentery, enlarged spleen, cough or fever (*Gheranda Samhita* 5/73).

Nadi Shodhana Pranayama/Anuloma-Viloma

Nadi Shodhana Pranayama is also known as *Anuloma-Viloma*. *Viloma* means produced in the reverse order. This variety gets its name from the fact that the nostrils are alternatively used in reversed way during each inhalation and exhalation.

Technique

- Sit in any comfortable posture.
- Keep the spine and the head straight with eyes closed.

Suryabhedana Pranayama

- Relax the body with a few deep breaths.
- Keep the left palm on the left knee in *Jnana Mudra* and the right palm should be in *Nasagra Mudra*.
- Place the ring and small fingers on the left nostril and fold the middle and index finger. Place the right thumb on the right nostril.
- Open the left nostril, breathe in from the left nostril, close the left nostril with the small and ring fingers and release the thumb from the right nostril; exhale through the right nostril.
- Next, inhale through the right nostril. At the end of inhalation, close the right nostril, open the left nostril and exhale through it.
- This completes one round of the *Nadi Shodhana* or *Anuloma Viloma Pranayama*.
- Repeat for another 4 rounds.

Ratio and timing

- For beginners, the duration of inhalation and exhalation should be equal.
- Gradually make the ratio 1:2, inhalation: exhalation respectively.

Breathing

- Breath should be slow, steady and controlled. It should not be forced or restricted in anyway.

Salient Features

- It is claimed that the practice of this *Pranayama* removes all impurities of *Nadi* (nerve impulses, *Samskara* or impressions) and helps to attain physical and mental well-being. Many experts do not consider it as *Pranayama*.This *Pranayama* practice is the preparatory phase where the energy flowing channels are purified. *Nadi Shodhana Pranayama* is a practice done actually before the eight *Pranayamas* explained in Hathayogic texts. This is the most common *Pranayama* prescribed for everybody without any problem. However, those who have some health problems should perform it without *Kumbhaka*.

Benefits

- It calms and steadies the mind, and improves focus and concentration.
- Purify the *Nadis* (energy channels), removes blockages from the mind facilitates the free flow of energy throughout the body.
- Improves blood supply to the brain.

- Balances the left and right hemispheres and promotes clear thinking.
- Strengthens immunity system.
- Reduces anxiety, stress and helps to manage hypertension.
- Provides sufficient oxygen for the functioning of every cell in our body.
- Removes waste products such as carbon dioxide and other toxic gases from the body.
- Stimulates calming centres of the brain.
- Strengthens muscles and helps to gain control over the diaphragm movement; improves abdominal tone and singing capacity.
- Benefits following conditions: asthma, allergies, high or low blood pressure, stress-related heart conditions, hyperactivity, insomnia, chronic pain, endocrine imbalances, psychological conditions such as anxiety and stress.

Precaution

- Initially retention of breath (*Kumbhaka*) should be avoided.
- People suffering from hypertension or any heart diseases, should practice it without *Kumbhaka*.

Bhramari Pranayama

The word *Bhramari is* derived from '*Bhramara*', which means black humming bee. While practising this *Pranayama*, a *sadhaka* makes a humming sound through the nostrils; this sound resembles the buzzing of a black bee; therefore, it is named as *Bhramari*. *Gheranda Samhita*, a text on Yoga, describes *Bhramari* as inhalation and suspension of breathing after closing the ears with hands.

According to *Hatha Yoga Pradipika*, in *Bhramari*, *Bhranganada* (sound of the male bee) is made during *Puraka* and *Bhringinada* (sound of the female bee) during *Rechaka*.

Bhramari Pranayama

Technique

- Sit in any comfortable posture with eyes closed.
- Close the ears with index fingers as shown in the figure.
- Inhale deeply through the nose.
- Exhale slowly in a controlled manner while making a deep, steady humming sound such as that of black bee. This is one round of *Bhramari*.
- Repeat for four more rounds.

Benefits

- *Bhramari Pranayama* delights the mind (H.P. 2/68).
- Practice of *Bhramari* relieves tension and anxiety; and reduces anger.
- It takes consciousness inwards and facilitates practice of *Samadhi*.
- It pacifies the mind.

Precautions

- People should not practice it during ear infection.
- People suffering from heart diseases, should practice it without *Kumbhaka*.

7. *Dhyana* (Meditation):

Dhyana or meditation is an act of continuous contemplation.

Dhyana

Technique:

- Sit in any comfortable posture.
- Adopt *Jnana Mudra* or *Dhyana Mudra* as in the figure.
- Arms and shoulders should be loose and relaxed.
- Gently, close the eyes and sit with a slightly upturned face.
- Maintain a mild focus between the eyebrows and be conscious of your breath.
- Dissolve your thoughts and try to attain single and pure thought.
- Meditate.

Note:

- For beginners, soothing music may be played in the background during meditation.
- Stay as long as you can.

Benefits

- Meditation is the most important component of Yoga practice.
- It helps the practitioner to eliminate negative emotions like fear, anger, depression, and anxiety and develops positive emotions.
- It keeps the mind calm and quiet.
- Increases concentration, memory, clarity of thought, and willpower.
- Rejuvenates the whole body and mind giving them proper rest.
- Meditation leads to self-realisation.

8. Shanti Patha:

ॐ सर्वे भवन्तु सुखिनः।
सर्वे सन्तु निरामयाः।
सर्वे भद्राणि पश्यन्तु।
मा कश्चित् दुःख भाग्भवेत्॥
ॐ शान्तिः शान्तिः शान्तिः॥

Om Sarve Bhavantu Sukhinah।
Sarve Santu Nir-Aamayaah।
Sarve Bhadraanni Pashyantu।
Maa Kashcid-Duhkha-Bhaag-Bhavet॥
Om Shaantih Shaantih Shaantih॥

Meaning:
May All Be Prosperous and Happy
May All Be Free from Illness
May All See What Is Spiritually Uplifting
May No One Suffer in Any Way

References for Yoga Practices

- **Prayer**: Kathopanishad- Shanti Path
- **Yogic Sukshma Vyayama** (Micro Circulation Practice): Yogic Sukshma Vyayama of Swami Dheerendra Bhramhachari.
- **Yogic Sthula Vyayama**: Yogic Sukshma Vyayama of Swami Dheerendra Bhramhachari.
- **Surya Namaskara**: Asana *Pranayama* Mudra Bandha by Swami Satyananda Saraswati.
- **Tadasana**: Also called as Taalaasana, Yogarahasya of Nathamuni, Kiran Tika, a commentary on Yoga sutras, Shree Yoga Kaustubha-25, Sachitra Caurasi Asana-34, Yoga Asanas by Swami Shivananda.
- **Utkatasana**: Gheranda Samhita-ii.27
- **Urdhva Hastottanasana**: A Monograph on Yogasana. MDNIY.
- **Kati Chakrasana**: A Monograph on Yogasana. MDNIY.
- **Trikonasana**: Yogarahasya-ii. 20 of Nathamuni
- **Pawanmuktasana:** Shree Yoga Kaustubha. It is done in sitting as per Yoga Asanas-3, Sachitra cauryasin Asane-5-7, Shree Yoga kaustubha-5, Kirana Tika-ii.46 on Yoga Sutra.
- **Sarala Matsyasana**: Asana Pranayama Mudra Bandha by Swami Satyananda Saraswati-page no. 187.
- **Viparitakarni**: Asana Pranayama Mudra Bandha by Swami Satyananda Saraswati-page no.257
- **Setubandhasana**: Yogarahasya of Nathamuni

- **Shavasana:** Gheranda Shamita-ii.19, Hathapradipika-i.32, Hatharatnavali-iii.20,76, Kapala Kurantaka Hathabhasya Paddhati-11, Yuktabhavadeva-vi.21, Asanani-14, Yoga Siddhanta Chandrika-ii.46, Shreetatva Nidhi-70, Kirana Tika on Yogasutra-ii.46, Brhada Yoga Sopana-iii.24, Hathapradipika, Shree Yoga Kaustubha-17.
- **Bhujangasana**: Gheranda Samhita. ii.42, with some variation, Kirana Tika-ii.46 on Yoga sutra, Hatha Yoga Samhita-49, Shree Yoga kaustubha-62, Yogamargapradipika-19, Yoga Rahasya of Nathamuni-ii.14, Jaipur Central Museum-7174.
- **Makarasana**: Jaipur Central Museum, with some variation in hands position.
- **Dhanurasana**: Gheranda Samhita-ii.10, Hatha Yoga Pradipika by Swami Muktibodhananda-i.25.
- **Vakrasana**: Easier version of Matsyendrasana (mentioned in Hathapradipika) given by Swami Kuvalayananda in his book Asan.
- **Ardha matsyendrasana**: Also called as Matsyendrasana, Hatha Yoga Pradipika by Swami Muktibodhananda-i.26, Gheranda Samhita-ii.22-23
- **Ardha Ushtrasana:** Easier version of Ushtrasna- Sri Yoga Kaustibha, NagojiBhatta Vritti on Yogasutra-ii.46, Gheranda Samhita-ii.41 describes Ushtrasana which is done lying in prone position.
- **Ushtrasana**: Shree Yoga Kaustibha, NagojiBhatta Vritti on Yogasutra-ii.46, Gheranda Samhita-ii.41 describes Ushtrasana which is done lying in prone position.
- **Janu Shirsasana**: The Illustrated Light on Yoga by BKS Iyengar- page no. 72
- **Pashchimottansana**: Gheranda Samhita-ii.24, Hatha Yoga Pradipika by Swami Muktibodhananda-i.28
- **Uttanamandukasana**: Gheranda Samhita-ii.35
- **Kapalabhati**: A variation of Bhastrika Kumbhaka of Gheranda Samhita-v.70-72, Kumbhaka Paddhati-164-165, Hathapradipika, Hatharatnavali-22-24, Hathatatvakaumudi-x.12-14, Yuktabhavadeva-vii.110-118.
- **Ujjayi Pranayama**: Hatha Yoga Pradipika by Swami Muktibodhananda-ii.51-53, Gheranda Samhita-v.69-72.
- **Nadi Shodhana Pranyama**: Hathapradipika, it has visualization and internal retention breath. Additionally, Gheranda Samhita-v.38-45 has time units for inhalation, retention and exhalation.
- **Bhramari Pranayama**: Hathapradipika, Hatharatnavalli-ii.26, Kumbhaka Paddhati-169.
- **Dhyana**: Yoga Sutra of Patanjali III.2

ANNEXURE 1

RECOMMENDED BOOKS FOR FURTHER READING

1. Avalon, Arthur. (2005). The Serpent Power. Shivalik Prakashan, Delhi.
2. Basavaraddi, I.V. & others. (2017). How to Manage Stress Through Yoga. MDNIY, New Delhi.
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ANNEXURE 2

COMMON YOGA PROTOCOL (CYP)

The United Nations designated June 21 as the International Day of Yoga (IDY) in 2014, to be observed annually. Since then, June 21 has been celebrated across the globe through a variety of events and programs, making IDY the largest public health movement in the world. The Ministry of Ayush, Government of India, being the Nodal Ministry for Yoga activities, developed the Common Yoga Protocol (CYP), which is a series of forty-five-minute-long Yoga practices that can be practiced by anyone, regardless of their age, gender, or fitness level.

The Common Yoga Protocol was prepared with the purpose to provide a concise yet informative introduction to Yoga and its practices to orient one towards achieving holistic health and to promote overall well-being of society at large. Moreover, it aims to raise awareness about the benefits of Yoga and its potential to bring about harmony and peace.

The CYP was prepared with an amalgamation of the ancient traditions of Yoga and the latest scientific insights on varied Yoga practices by a team of experts from the Ministry of Ayush, the Morarji Desai National Institute of Yoga (MDNIY), and other esteemed Yoga institutions. The team consisted of 20 Yoga experts who worked on developing the Yoga protocol over a period of several months.

The CYP was then reviewed and approved by a committee of over 50 Yoga experts, leading Yoga masters and researchers from various fields, including Yoga Philosophy, Anatomy, Physiology, Modern medicine and Yoga therapy. It was finally edited by Dr. Ishwar V. Basavaraddi, Director, Morarji Desai National Institute of Yoga (MDNIY), Ministry of Ayush, Government of India. The final version of the CYP was launched on the first-ever celebration of the International Day of Yoga i.e. June 21, 2015.

The CYP has been published in several languages to make it accessible to a wider audience worldwide. As per the Ministry of Ayush, Government of India, the Common Yoga Protocol is available in sixteen languages including English, Hindi, Sanskrit, Manipuri, Kannada, Marathi, Malayalam, Bengali, Kashmiri, Tamil, Urdu, Telugu, Assamese, Punjabi, Oriya and Gujarati. (https://yoga.ayush.gov.in/common-yogaprotocol).

S. No.	Practices	S.No.	Name of the Practice
I.	**Invocation**	1	Starting Prayer
II.	**Loosening Practices**	2	Neck Movements
		3	Shoulder's Movement
		4	Trunk Movement
		5	Knee Movement
III.	**Standing Asana**	6	Tadasana
		7	Vrikshasana
		8	Pada-hastasana
		9	Ardha Chakrasana
		10	Trikonasana
	Sitting Asana	11	Bhadrasana
		12	Vajrasana
		13	Ardha Ushtrasana

		14	Ushtrasana
		15	Shashakasana
		16	Uttana Mandukasana
		17	Vakrasana
	Prone Lying Asana	18	Makarasana
		19	Bhujangasana
		20	Shalabhasana
	Supine Lying Asana	21	Setubandhasana
		22	Uttanapadasana
		23	Ardha Halasana
		24	Pawana Muktasana
		25	Shavasana
IV.	**Kriya**	26	Kaphalabhati
V	**Pranayama**	27	Nadi Shodhana Pranayama
		28	Sheetali Pranayama
		29	Bhramari Pranayama
VI.	**Dhyana**		
VII.	**Sankalpa**		
VIII.	**Shantih Patha**		
Total Duration=45 minutes			

Committee of Yoga Experts:

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3. **Sh. O.P. Tiwari**, Chairman, S.M.Y.M Samiti, Kaivalyadhama, Lonavla .
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10. **Swami Ullasa**, Isha Yoga Foundation, Coimbatore.
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ANNEXURE 3

Y Break "Yoga break at workplace" – Mobile App

Y Break "Yoga break at workplace" program was conceptualized by Ministry of Ayush, Government of India with an aim to get De-stressed, Refreshed and Re-Focused to increase the productivity of individuals at the work place by practicing selected Yoga practices of 5 minutes (twice a day) time frame to accrue the benefits as projected from Yoga practice for a longer duration.

The Yoga protocol in the Y-Break application comprises of a few simple Yogic practices consisting of *Asana, Pranayama* and *Dhyana*, which is as follows:

- *Tadasana- Urdhva-Hastottanasana*
- *Skandha Chakra- Uttanamandukasana*
- *Ardha Chakrasana, Prasarita Padottanasana*
- *Kati Chakrasana*
- *Deep Breathing, Nadishodhana Pranayama*
- *Bhramari Pranayama- Dhyana*

Y Break – Mobile app is freely available on Google play, IOS app store. This is very cost effective and user friendly. This app has already been downloaded 50 thousand times by the users and still there are registered participants.

Android version Download Link:
https://play.google.com/store/apps/details?id=ayush.gov.in.ybreak&hl=en_IN&gl=US

IOS versions Download Link: https://apps.apple.com/in/app/y-break/id1555002781

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