PREDICTORS OF SUCCESSFUL AGING: ASSOCIATIONS BETWEEN SOCIAL

NETWORK PATTERNS, LIFE SATISFACTION, DEPRESSION,

SUBJECTIVE HEALTH AND LEISURE TIME ACTIVITY

FOR OLDER ADULTS IN INDIA

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Aging in the new millennium is greatly influenced by both global and region-specific factors. In Asia, the aged population is increasing at a faster rate than both Europe and North America, making issues related to older adults needing immediate attention of researchers & planners. This study aims at identifying the predictors of successful aging. Successful aging as a construct often has an integration of good social engagement, sense of purpose in life, maintaining cognitive capacity and functional autonomy. One hundred fifty participants in India completed the Life Satisfaction Questionnaire, Geriatric Depression Scale, Health Awareness Schedule, and the Leisure Time Activity Record. Firstly, it is mainly evident that social support network is larger for older adults residing in a joint family as compared to a nuclear family setup. Further, married males in a joint family have the largest network size compared to all the other groups. The study however, reveals an interesting reverse trend of widowed females having a larger network size compared to widowed males. Statistical analysis found measures of successful aging to be highly correlated with each other, with subjective health and depression being significant predictors of life satisfaction. Further, life satisfaction, depression levels, and leisure time activities were all significant predictors of subjective health. Significant gender differences were found on life satisfaction and subjective health with married males living in joint families reporting the highest scores on all the above measures. In addition, widowed women

showed the highest levels of depression, which relates to their lower life satisfaction, poor ratings of health and low involvement in leisure activities. The study achieved a higher understanding of successful aging and presented a novel finding of educational level being significantly correlated with all measures of successful aging. This study is the first of its kind to measure successful aging in an urban Asian-Indian population. However, more research is needed to examine other age-related variations to enable generalization of results to a larger culturally diverse population.

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CHAPTER I

INTRODUCTION

Brief Overview of Aging and Related Concepts

Demographics of Aging

Aging is a multidimensional change involving the physical, psychological as well as social aspects for an individual. It can be described as a progressive deterioration of the physical and mental functions resulting in a simultaneous decline in both the capacity of the body to maintain homeostatic balance as well as the adaptability of the individual to various stressors thereby consequently increasing the chances of illness and mortality. However, not all individuals age in a similar way. In biological terms, aging is a dynamic process that represents the molecular, biochemical, physiological and structural changes that take place in an individual following the cessation of growth (Dey, 2003).

The proportion of older adults is gradually increasing and the percentage of older people in the world population is expected to increase rapidly from 9.5% in 1995 to 20.7% in 2050 and further to 30.5% in 2150 (United Nations, 1998). In absolute numbers, this would imply an increase from 542 million individuals in 1995 to 1.9 billion individuals in 2050 and 3.3 billion older adults by 2150. Although, we know that the elderly population has been growing globally, what appears to be relatively new and significant is the rapid pace that this segment is increasing in the Asian region. In Asia, the aged population is increasing at a faster rate than both Europe and North America (Nayar, 2003). Thus, for Asian societies, the issues related to the elderly need immediate attention of researchers, planners, and welfare agencies. China and India,

Asia's most populous nations, are estimated to contribute a significant proportion of this growing number of older people (Irudaya-Rajan, Misra & Sarma, 2001).

India had earned the distinction of being a 'greying nation' with about 7.7% of its population consisting of older adults. Demographic projections estimate that more than 176 million of Indian citizens will be in the age group of over 60 years of age, considered the geriatric age in the country. This would make it the second largest population of the elderly in the world and 13% of India's population by 2025 (Chadha, 1997). Over the years, there has been a steady increase in the number of older adults in India, especially women. The size of India's elderly population aged 60 years is estimated to increase from 71 million individuals in 2001 to 179 million individuals in 2031 and further to 301 million older adults by 2051. In addition, looking at the demographic transitions within India, the pattern currently indicates that southern India has the highest number of older adults over 60 years of age and will continue to maintain this trend in the future. Central India with the second largest number of older adults in 2001 is also projected to increase its population at the same pace as southern India by 2051, while lowest numbers are expected in northeast India (Christophe & Irudaya-Rajan, 1998).

Aging in the new millennium will be greatly influenced by both global and region-specific factors. The increasing numbers as well as significant changes in the sociocultural milieu are responsible for the recent emphasis on studies pertaining to older adults in India. Even though the increasing numbers are attributable to the demographic transition, a decline in the condition of the older population has been the result of fast eroding traditional family system as well as a substantial increase in the

migration of adult children from home. This has resulted in the caregiver issue becoming a growing concern for national policy makers. The family as a single unit is undergoing changes leading to significant adjustments in accommodating and caring for older adults in the family, making them more vulnerable to illness and psychosocial strains in the absence of familial support network. In addition, these increasing numbers will result in a direct impact on the demand for health services in the country. Since the primary health care system is not geared up for meeting the demands on this vast a number, this will result in increasing the burden of care on both the individual and the families of these older adults.

Therefore, mobilizing additional resources for geriatric care as well as monitoring health behaviors will emerge as a major responsibility for health care professionals in India. However, challenges arising from growing old, especially in the area of behavioral and emotional health have not received much attention in the past. More information and research is needed with regards to the determinants of quality of life, self-concept, well-being and health to further our understanding of life experiences in later years and therefore provides a rationale for this study.

Theoretical Perspectives on Aging

Despite the tremendous interest in aging, the concept remains poorly understood yet excessively theorized. Psycho-social theories however, help in identifying the degree and the nature of psycho-social factors associated with change across the adult life course as well as measures the extent frustration and contentment of these change agents at various stages of the life cycle of the individual.

Disengagement theory. Disengagement theory was one of the earliest theories proposed in social gerontology and focused on adjustments to role change among the elderly, postulating that role loss led to maladjustments for the individual. Cummings and Henry (1961) refer to the aging process as "an inevitable mutual withdrawal or disengagement resulting in decreased interaction between the aging individual and the others members of his social system". They further state that this disengagement from social interactions that occurs in old age is a universal process. Thus, disengagement implies a loss of roles, restriction of social contacts and relationships, reduced commitment to social values as well as reduction in activity levels and involvement causing a loss of morale.

The Indian version of this theory is known as the 'Ashrama theory' or the notion of the four-stage ideal life course (Bhatia, 1983). This cultural version emphasizes the traditional Hindu view of life and delineates four 'Ashrams' or distinct stages or phases of human life and development. The first stage that every individual goes through is the 'Brahmcharya' stage, which is a stage of learning skills and receiving an education and lasts roughly for the first 25 years of life. This stage is followed by the 'Grihasthashram'**,** roughly coinciding with the domestic phase involving performing the duties of a householder as well as raising and maintaining a family, lasting from age 26 to age 50. 'Vanaprastha' represents a stage of gradual withdrawal, without reducing responsibilities and is roughly between 51 and 75 years. The last stage, **'**Sanyasa'**,** is one of total renunciation of all attachments and submission of oneself to the pursuit of spiritual freedom. Essentially this stage represents retirement from the mundane and

routine activities of life. The third and fourth stages are often combined to represent the present retirement phase of over 65 years.

These stages are not rigid or mandatory or even obligatory on the part of any individual, but they have been suggested as a means of ensuring a smoother transition in life and are well known and accepted by the members of the society. This theory however, views social disengagement with regards to age stratification, age based roles and social sanctions. This theory however has been criticized since the amount of disengagement or involvement is now seen more as a function of past life patterns and socioeconomic factors rather than being an inherent process (Palmore, 1969).

Activity theory. Activity theory (Havinghurst, 1953) was developed in direct opposition to the disengagement theory to primarily define the concept of successful aging. It emphasizes that normal and successful aging involves preserving the attitudes and activities of middle age for as long as possible, thereby keeping the older adult psychologically, behaviorally and socially fit. In addition, it also views the relationship between the society and the aging individual as stable. Research has also repeatedly found a positive association between morale, personal adjustment and activity levels of older adults (Palmore, 1979).

Activity theory postulates that the greater the role loss for the individual, the lesser is his participation in various activities. However, if the level of activity remains high, the availability and stability of role identity is also high resulting in an improved self-concept and life-satisfaction. Activity theory has however been criticized for oversimplifying the concepts and does not provide an adequate explanation for the interests and abilities surrendered by older people as they cross middle age.

Continuity theory. Continuity theory views various stages of the life cycle as being characterized by a high degree of continuity. It starts with the single notion that the individual tries to maintain his/her lifestyle for as long as possible and then adjusts and adapts to situations based on his/her perception of their changing status. The decision regarding the roles to be discarded or maintained is largely determined by the individual's past history and preferred style of life (Neugarten, 1968). Even though the continuity theory has the advantage of offering a multiplicity of adjustment patterns, there have been difficulties in empirically testing this theory.

Aging as an exchange. The exchange theory (Dowd, 1975) provides a link between an individual's personal resources and the nature of their social interaction. According to this theory, people enter into social relationships to derive rewards like recognition, security, love, etc. and in the process also incur costs like unpleasant experiences and fatigue. Power is usually derived from imbalances in social exchange, with maximizing rewards and minimizing costs. In the case of the elderly, there is often deterioration in their bargaining position and decreasing power resources, resulting in increasing their vulnerability to a multitude of psycho-social factors.

Thus, there are a number of factors that influence the aging process. These varied perspectives provide alternative explanations of the aging process and add to our understanding of the multiplicity of directions for future research.

Social Network Patterns

A variety of aspects of social engagement and social network such as duration, quality of linkages, and identity of the individual in the network have been effectively examined in understanding the aging process. Research indicates that the maintenance

of robust social networks becomes an important factor in prediction of satisfaction with life, activity levels as well as adequate mental health of individuals as they age (Van Willigen, Chadha & Kedia, 1995). The aged in Asian traditions have always occupied a position of respect to the point of reverence. Respect for age is a deeply embedded cultural value, and possibly derives its strength from the ancient religious texts from the Indian subcontinent.

Traditionally, the informal support systems of family, kinship and community are considered strong sources of providing support to the older adults in the society in India. Older adults typically enjoy an "ascribed" status providing them with authority, wisdom, maturity, prestige and power in the society. In general, in Asian societies, the elderly remain integrated with the family and the community. The older people in urban areas to a large extent still enjoy a fairly high status in their families and are generally well-respected by their children. Desai and Naik (1971) report that in the advice of the elderly is usually taken in all family affairs. In addition, recent studies indicate that the attachment between children and their parents as well as the commitment to care of the elderly is an essential element in Indian culture (Ramamurthi & Jamuna, 1993). This includes providing emotional, financial as well as socio-cultural support and assistance in varying degrees.

Gender clearly influences the type and the amount of care received for a person. Women care-givers provide typically provide personal care, housekeeping tasks and meal preparation, male care-givers provide assistance with home-repairs, transportation and financial management (Bali, 2003). In addition, the size and the composition of the support network influences the organization and provision of care. Larger networks of

caregivers often result in sharing of responsibilities. Srivastava (1988) reported that 66% of Delhi's population lives in a joint family setting and about 33% population lives in nuclear families, with over 60% individuals living in households with five or more members. An Indian joint family typically consists of an older married couple, their sons and daughter-in-laws, unmarried daughters and sons' children. The presence of at least two married couples residing in the same house is the distinguishing feature of joint families. The joint family is both a collective as well as a set of individuals. A number of factors mediate family exchange and can be classified into family structure, interpersonal relationships and personal circumstances. Research indicates that a joint family system provides an important mechanism for the social support of older adults (Kolenda, 1987).

However, with the dynamic and rapid socio-cultural changes, several structural changes are taking place in the traditional Indian society. The pressure on the traditional methods of caring for older family members is expected to increase partly driven by urbanization. As a result, changes in kinship networks, living arrangements and inter-generational dynamics are likely to increase at a faster rate in urban areas of India. Members of joint families are living geographically apart and family structures are increasingly becoming smaller and more independent. The "ascribed" status of the older population is gradually being replaced by the "achieved" status of the younger population resulting in drastic changes in family structure, social norms and an increased psycho-social strain especially in the urban areas for the former section of the population. The changing social environment has affected the family structures, individual lifestyles as well as the role of the family as a care-giver influencing the self-

concept, incidences of depression, loneliness and involvement in the community for the elderly in India.

Life Satisfaction

A feeling of satisfaction with life is an important factor for a general sense of well-being (Neugarten 1982) and has been emphasized in research related to subjective well being. Life satisfaction often refers to the attitudes that individuals have about their past, present as well as future in relation to their psychological well being (Chadha & Van Willigen, 1995). Research has indicated that the concept of high life satisfaction can be equated to that of successful aging (Jamuna, 1994; Husain & Singh, 1995). The meaning of successful aging is elusive and can be highly susceptible to one's own social value or judgments about the important aspects of life. However, this concept with regards to life satisfaction has psychological as well as social implications. Firstly, it implies the personal contentment with life and positive self-regard for an individual and secondly it includes a personal appraisal of fulfilling one's social roles or obligations. Successful aging includes three components: low probability of disease and disease-related disability, high cognitive and physical functional capacity and active engagement with life (Rowe & Kahn, 1997). Vita, Terry and Huber et., al (1998) also report that in recent years, a greater percentage of older adults appear to be living up to this model and succeeding at living independently and without disabilities.

Life satisfaction among the elderly is an important concept as it gives us an overall view of the adjustment as well as adaptive coping ability of the individual. Sarkisian, Hays and Mangione (2002) further found in their study that individuals with lower life satisfaction and lower expectations about aging typically do not perceive it as

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important to seek health care for age-associated conditions and therefore experience higher levels of depression, have less energy and poor health-related quality of life. The level of satisfaction among the aged effects not only their psychological adjustment but also physical, emotional and social well-being. Therefore, social support network, perceived health and leisure time activity may be associated with life satisfaction.

Subjective Health and Well-being

Subjective well-being is a rapidly growing area both in research and applied fields of psychology. The concept is important for understanding the well-being of an individual with regards to cognitive and affective reactions to their life along with specific domains of life. Subjective well-being consists of three interrelated components of life satisfaction, pleasant affect and depression (Diener & Suh, 1997). High feeling of well-being and life satisfaction also has a direct impact on domains of life such as work and leisure time activity.

The elderly invariably suffer from diseases of the respiratory system; symptoms of ill-defined arthritis and rheumatism, hypertension, congestive heart failure and diabetes and many people often consider illness among older adults to be a symptom of aging (Nayar, 1996). However, self-rated health or the perception of an individual about one's health has a definite effect on one's well being. Maintenance of health in old age is linked with health beliefs, attitude and practice of positive health behaviors among individuals (Reddy & Ramamurti, 1996). Various theoretical perspectives have also supported perception of health associated with the nature of coping as well as engaging in positive health behavior by the individual.

Protection Motivation Theory. This theory postulated by Maddux and Rogers (1983) is partially based on the work of Lazarus and Leventhal. It describes adaptive and maladaptive coping with a health threat primarily as a consequence of two appraisal processes. These include a process of threat appraisal and a process of coping appraisal, in which the behavioral options to diminish the threat are evaluated. Thus, individuals who perceive themselves as elderly are significantly more maladjusted compared to other cohorts (Boer & Seydel, 1996). The appraisal of the health threat and the appraisal of the coping responses result in the intention to perform adaptive responses (protection motivation) or may lead to maladaptive responses, which places an individual at health risk.

Health Belief Model. Perceived health can also be understood in relation to the Health Belief Model, where it can be defined as any medically recommended action, voluntarily taken by the individual who believes himself/herself to be healthy and takes action to prevent as well as detect disease in an asymptomatic stage (Langley, 1977). The Health Belief Model offers one of the most influential explanations for the reason that people engage in certain health behaviors (Rosenstock, 1966,1974).

This model suggests that an individual's decision to perform a health behavior is influenced by a wish to avoid becoming ill and a belief that a specific health action will prevent or reduce the illness. The model also specifies two basic types of beliefs, which are hypothesized to motivate individuals to engage in particular preventive behaviors. These are perceived vulnerability to and the perceived seriousness of the consequences of incurring a disease, which then heightens the 'psychological state of readiness' to take specific action. Given the high state of readiness, the direction of the

action taken by the individual depends upon their beliefs about relative effectiveness and availability of alternative actions known to the individual (Rosenstock, 1966, 1999).

Kergels (1969) has introduced the concept of "saliency" of health as being an important modifier of the Health Belief Model. He suggests that the motivation to engage in preventive health behaviors may be operative only for those who view their health as salient or having a high priority when compared to other activities in life. Although a few studies have completely supported the model, a vast majority or research has found only partial support for the model.

In order to better understand health attitudes amongst the elderly, various other factors affecting health behaviors need to be studied. The conceptual structure of the current models attempting to account for health actions however does not deal with environmental or personal factors such as life events as being the direct or indirect determinants of health actions.

Physical Health and Aging

The definitions of health usually take a wide range of factors into account. The contribution of physical, mental and social well-being is reflected in the World Health Organization's holistic definition of health (World Health Organization, 1958). Research has also shown the importance of functional ability (Barsky, Cleary, & Klerman, 1992; Johnson & Wolinsky, 1993), lifestyle and preventive health practices (Krause & Jay, 1994; Ross & Bird, 1994) for maintaining good health. Health may be conceptualized as a state of well-being measured by the subjective assessment of overall health, life satisfaction and physical functional capacities of older adults.

Aging is a process and not a static entity observed at a single point in time. Aging

has medical, psychological, social and economic dimensions and is a collective term for

all the progressive, deteriorative changes that occur in mature individuals that lead to a

reduced expectancy of life with increasing age. The aging process seems to vary from

one person to another depending on physical, psychological and environmental

conditions and amongst the major problems are those related to reduced efficiency of

the heart and blood circulation, and those affecting learning and memory. A decline in

physiological functioning also seems to herald a change for the worse in psychological

functioning and in the overall mental health of the elderly and some of the important

factors are discussed below.

Dementia. Dementia is a syndrome produced brain dysfunction due to acquired

or continuous compromise of intellectual functions and neuropsychological activity. The

likelihood of developing dementia increases with age, with 5% of people above 65 years

of age and 20% above 80 years, experiencing severe cognitive impairment resulting in

a diagnosis of dementia. Recent studies from India indicate a prevalence of 2.7% to

3.6% of older adults suffering from dementia (Rajkumar, 1992).

Factors Determining Health Attitudes and Behaviors in the Elderly

Importance of life events. Currently, life events are primarily viewed in the

paradigm of psychosomatics and the beginnings can be traced back to the pioneering

work done by Cannon in the 1930's where he combined various psychological states to

physiological changes. Meyer clinically advanced the field in the 1950's by diagnosing

illnesses after charting life events and the quantification of associations between life

events and their possible effects was initially seen in the Holmes and Rahe's Social Re-adjustment Rating Scale (Holmes & Rahe, 1967).

A review of the current literature which places life events in a health, health attitude and health behavior context includes, coping and sense of coherence in relation to personal and collective resources like social networks (Anson et al., 1993), the effects of hassles in daily living (DeLongis et al., 1982; Ruffin, 1993), and the role of planned as well as unplanned life events in the subjective judgments of well-being (Ryff, 1989). In addition, the positive role of emotional support in experiencing life events (Rosengren et al., 1993) as well as the associations between number of experienced life events and the use of health care (Sherbourne, 1988) have also been seen to have a significant relationship with both health attitudes and health behaviors.

It is commonly presumed that experiencing a special or traumatic life event gives rise to poorer health. However, both the recent and past seem to play a greater role after the occurrence of a life event than is generally assumed. In a study by Anderson and Stanich (1996), results indicated that an awareness of special events that are decisive in changing lifestyle usually extends over the entire adult life. Individuals who experienced a life event expressed fair to good satisfaction with health which was however lower than those with no reported life event. Least satisfaction with health was found in the restricted mobility group.

The association between greater worry over health and generally more positive health attitudes and health behavior in the life event groups may at times, seem inconsistent. In the same study, a deeper look into the life event groups revealed lower self-appraised health ratings and higher presence of disease. Since health and well

being in older age are largely a result of experiences throughout life span, work on aging and health requires a holistic approach.

Subjective health. Perceived health has also been seen to serve as a good indicator of current health status. Perceived health provides a global evaluation of health status, incorporating comprehensive domains of health and serving as a summary of an individual's perceptions of various objective and subjective aspects of health (Liang, 1986). Literature increasingly suggests that the link between physical and mental health is mediated by an individual's subjective health (Martin, Rott, Kerns, Poon & Johnson, 2000).

Review of the literature also shows that perceived health correlates positively with more objective measures (Johnson & Wolinsky, 1993; Linn & Linn, 1980), physical exam or physician rating (LaRue, Bank, Jarvik & Hetland, 1979), and chronic conditions (Jylhä, Leskinen, Alanen, Leskinen & Heikkinen, 1986). Good correlations have also been found with functional status (Barsky et al., 1992; Johnson & Wolinsky, 1993), depression and other psychological characteristics (Blazer & Houpt, 1979), and socioeconomic status or economic condition (Markides & Lee, 1990; Wan, 1976). Chou and Chi (2002) also found that Chinese participants with higher levels of education, more close relatives, more frequent contact with their friends, better self-rated health, and higher levels of life satisfaction were more likely to meet criteria for successful aging. On the other hand, older female participants with a higher financial strain and more hearing impairment were less likely to meet more criteria in successful aging.

It has been seen that currently, there is also a greater desire amongst older people today to empower themselves with positive health behaviors to actively change

their sense of self worth. Thus, efforts made to promote successful aging by promoting physical fitness, averting early onset of degenerative changes would help in enhancing the overall functional competence and would help in making the elderly a resource in the community.

Depression

Late-life depression is one of the most common mental health problems in adults aged 60 or older (Blazer, Hughes & George, 1987) and has been the focus of increasing interest. As the world's population ages, there is growing interest in the prevalence and significance of depressive symptoms and disorders in the elderly. The excess disability, morbidity, and mortality associated with late life depression have been well-established (Alexopoulos et al., 1996). Looking at the problem from a global perspective, it is essential to document the distribution and characteristics of depressive symptomatology amongst older populations in developing nations (Ganguli et al., 1999).

However, there are several problems when studying depression in the elderly. Firstly identifying the disorder; comorbidity with somatic disorder as well as dementia can make the depressive symptoms difficult to recognize. Additionally, the diagnostic instruments for depression are not validated for use in the elderly. Although, late-life depression has been shown to be influenced by genetic, situational, illness-related biological, and psychosocial factors, it is more influenced by environmental events (Reker, 1997).

The psychosocial model of mental health posits that late-life depression results from the loss of self-worth, loss of meaningful roles, declining social contacts owing to health limitations and reduced functional status, dwindling financial resources as well as

a decreasing range of coping options (Reker, 1997). Research has indicated that social network size and frequency of contact are important social factors that can improve quality of life for older adults (Baxter, 1998). Interestingly, studies have also shown that the giving of social support to others is inversely related to late-life depression (Koenig, 1986).

Leisure Time Activity

Leisure for most people means activities which are not related to their regular, routine work, but which give them the maximum amount of personal pleasure. Traditionally, the elderly, both men as well as women have spent their sunset years interacting with their grandchildren, and generally participating in simple household chores. The leisure time and related activities are also dependent on the position and activities of the elderly prior to retirement from an active to a more passive stage of life. Research shows that in India, relatively few individuals seem to take an independent attitude to life, and still fewer tend to cultivate a meaningful hobby, or have the time and inclination to do so (Dey, 2003).

Many elderly usually feel frustrated and regret not having cultivated a hobby or activity. This scenario seems to be the norm for many elderly, whether in urban or rural settings, although there are quite a few who have planned for their old age and look forward to growing old and adapting to changes in a positive manner (Nayar, 2003). It has been found that the various leisure time activities adopted by the educated elderly include walking, reading the newspaper thoroughly, listening to the radio and watching television, reading books, and organizing religious activities. Soodan (1975) found a direct relation between educational attainment and free-time activity, and also found that

even though the majority of women do not completely give up their domestic role, the majority of men tend to involve themselves in household chores. It would be interesting to know from the elderly about the manner in which they would like to spend their leisure time, since it is hard to gather such information for the region as a whole.

The present study aims to assess the effect of social support network patterns, in terms of the joint family and the nuclear family setup on the degree of life satisfaction, depression, subjective health and leisure time activity for older adults. Society in India is transitioning from a traditional to being more industrial and urbanized. As a result, the joint family that met the psychosocial needs of the older people is also gradually losing its productive function. One of the most significant trends affecting older people is the change in living arrangements and family structure (Van Willigen, Chadha & Kedia, 1996).

In conclusion, even though the research regarding the challenges faced by the elderly in India is extensive, there is a paucity of research regarding factors contributing to successful aging. The study also becomes important in the Indian context due to the absence of a clear national policy and the paucity of evidence-based data for adequate health care provision to the geriatric population (Dey, 2003). The understanding of the parameters of successful aging like, life satisfaction, functional independence, adequate mental health and social engagement therefore becomes all the more important to reduce the burden on the primary health care system by helping older adults perceive their heath in a more positive manner. In addition, more measures need to be constructed and validated to enable research regarding the various concepts related to the elderly in India.

Hypotheses

Successful aging as a construct often has an integration of good social engagement, sense of purpose in life, maintaining cognitive capacity, and functional autonomy. While active aging has been considered as a solution to the growing challenges associated with an aging society, there is little or no research on the determinants of active aging within the Indian context.

It is hypothesized that social support network for the older adults will be higher for those residing in a joint family system as opposed to those living in a nuclear family setup. In addition, an attempt will also be made to see if males and females differ significantly in their patterns of maintaining social networks.

It is also hypothesized that older adults with high life satisfaction will have low levels of depression, better subjective health and leisure time activity. Differences between males and females will also be assessed to replicate the findings of Chadha et al. (1996) study, which reports that older widowed females are higher on depression and lower on life satisfaction as compared to males.

Health is an important factor in the life of older adults and it affects almost every single aspect of their life, including determining successful involvement in activities and tasks. In essence, health seems to be one of the most significant factors effecting adjustment, well-being and happiness in old age. It is hypothesized that older adults with positive perceptions of their health will show high life satisfaction, low depression and high involvement in leisure time activities.

CHAPTER II

METHOD

Participants

The present research was conducted in New Delhi, India. The sample consisted of 150 participants from the older adult population selected according to the demographic and socioeconomic distribution in the city (Electoral Roll, 2005, State/UT-U05). All the participants resided in an urban county in the southern part of New Delhi and were able to read and write in English. The sample was further classified on the basis of the social network pattern, with 76 individuals residing in a joint family system and 74 individuals residing in a nuclear family setup selected according to the voter's list provided by the office of the Delhi Election Commission. All participants were between 65 and 75 years of age, belonging to the middle-income group.

Exclusionary criteria included cognitive impairment or functional disability, based on data obtained from questionnaire administration (see below). A score less than 23 on the Mini Mental Status Examination is indicative of cognitive impairment in the elderly and individuals obtaining less than this cutoff score were excluded from the study. Information regarding functional disability was also obtained from family members and older adults with any disability were excluded from this study.

Measures

Life Satisfaction Scale (Chadha & Van Willigen, 1995). Life satisfaction often refers to the attitudes that individuals have about their past, present and future regarding their lives. Some studies have equated high life satisfaction with that of successful aging (Rathore, 1992; Jamuna, 1994). Bradley and Fisher (1995) also

confirmed social interaction, sense of purpose, self-acceptance and functional independence as determinants of successful aging. The Life Satisfaction Scale (Chadha & Van Willigen, 1995) assesses life satisfaction as an individual's interpretation of his past and present life and consequent happiness and satisfaction. This scale is designed to measure the construct of life satisfaction amongst older adults in an Indian cultural setting.

The scale consists of 27 items, with a maximum score of 189 and minimum score of 27 and is also bilingual, with a version in Hindi. The scale has a high reliability value of 0.95 and is therefore a good measure of life satisfaction for the elderly population. Nagpal and Chadha (1996) using the Life Satisfaction scale found that institutionalized elderly females showed significantly higher scores on past life satisfaction while non-institutionalized females showed higher scores on future life satisfaction. In addition, social support network, perceived health and leisure time activity appeared to be associated with life satisfaction.

Geriatric Depression Scale (GDS). The GDS has previously demonstrated reliability and validity in elderly populations and has been shown to be both sensitive and specific for depressive disorders (Ganguli et al., 1999). Sensitivity and specificity are one approach to quantifying the diagnostic ability of a test. The GDS has been validated against Research Diagnostic Criteria and is able to discriminate among normal and mildly and severely depressed adults. It is a 30-item inventory, with a yes/no format. Individuals reporting 0-9 symptoms are considered normal, those reporting 10-19 symptoms are considered mildly depressed, and those reporting between 20-30 symptoms are considered severely depressed. The GDS was found to

have a sensitivity of 0.92 and a specificity of 0.89 when evaluated against diagnostic criteria. Sensitivity is the proportion of true positives, which are correctly identified by the test, while specificity is the proportion of true negatives that are correctly identified by the test. The validity and reliability of the tool have been supported through both clinical practice and research. The GDS has excellent reliability and validity (test-retest reliability = 0.85; internal consistency = 0.94). The scale primarily taps the affective and motivational/cognitive components of depression in the elderly. The scale deliberately does not examine the neurovegetative and somatic components, resulting from a variety of co-morbid medical conditions in older people which can lead to errors in diagnosis of the condition (Sheikh et al., 1991).

The original GDS (Yesavage et al., 1983) was specifically developed for use in the elderly population and was translated into Hindi for use with an Asian-Indian population through the Indo-U.S. Dementia Epidemiology Study (Ganguli et al., 1996). The Hindi version (GDS-H) is also a 30-item questionnaire and has excellent internal consistency of 0.92 and has a factor structure comparable to the original English language version (Sheikh et al., 1991). Research regarding depression in Indian patients suggests that the condition is often manifested by symptoms of prominent anxiety and agitation rather than psychomotor retardation or guilt (Derasari & Shah, 1988; Venkoba Rao, 1993). In addition, Ganguli et al., (1999) also found that higher reporting of depressive symptom was independently and significantly associated with lower cognitive function scores, and greater levels of reported functional impairment. Since a high score on the GDS is a good indicator for assessing the cognitive

impairment and functional impairment in elderly Indian population, it helped in excluding

participants with any cognitive/functional impairment from the present study.

Mini Mental Status Examination (MMSE). The incidence of dementia increases

with age and is currently recognized as a major public health problem in the world. The

detection of this disorder becomes all the more important in developing nations, where

more than the 70% of the world's one billion people aged 60 and over will be located by

2020 (World Health Organization, 1998). Since this study focuses on healthy older

adults, the MMSE was primarily used to screen the participants for any cognitive

impairment, who were then excluded from the study population. Dementia screening is

typically performed by the means of a brief mental status test such as the Mini-Mental

Status Examination, which contains 30 items. The standard diagnostic criteria for

dementia require impairments in two or more cognitive domains accompanied by

difficulty in social and occupational functioning. A score of 23 is taken as the cut-off for

cognitive impairment and had the instrument has a sensitivity of 0.69 and a specificity of

0.99 (Tangalos et al., 1996).

The Hindi Mental Status Examination or the HMSE (Ganguli et al., 1995) has

been developed as a screening tool for the older Indian population with minor changes

from its original version with respect to cultural differences and language usage. The

HMSE is both highly sensitive and specific in screening for the disorder adequately

(Pandav et al., 2002) in the Indian population.

Health Awareness Schedule (Chadha, Easwaramoorthy & Kanwara, 1990). This

schedule was developed by the authors to enable assessment of health awareness

amongst older adults in an Asian-Indian context. The schedule is a good indicator for

self-ratings of both physical as well as mental health. The assessment of self-rated physical health is based on a visual analog scale. The items selected to assess subjective health include "How would you rate your overall health at the present time", "How is your present health compared to five years ago", and "How do you perceive your health to be five years from now?" Total scores range from 0 (negative perception of health) to 10 (positive perception of health). In addition, mental health ratings are based on yes/ no type of answer and consist of 32 items. Reliability value of 0.63 for the scale based on the items is seen to be acceptable.

Leisure Time Activity Record (Van Willigen & Chadha, 1990). An assessment of leisure activities provides a better insight into understanding the subculture as well as the association with the socio-cultural systems for older adults. Participation in leisure activities has been seen as important in maintaining feelings of self-worth and can serve as a bridge between pre and post retirement times (Atchley, 1971). Russell (1987) found that satisfaction with recreational activities showed a significant and positive relationship with life satisfaction amongst the elderly.

The Leisure Activities Record takes into account leisure activities from a cultural perspective for older adults in India. It is a 23-item record, which classifies leisure activities into cultural, physical, social and solitary activities. Cultural activities involve visiting places of worship and attending community events while physical activities involve exercising, doing household chores and gardening. Social leisure activities involve visiting friends and relatives, looking after grandchildren, voluntary involvement in the community and outings with family members. The solitary activities include reading, taking naps, watching television and writing letters. The variation in the pursuit

of these leisure activities can provide valuable information regarding psychological and socio-cultural attributes of an individual. This study, categorized involvement in leisure time activities as none, low (1-2 activities), moderate (3-4 activities) and high (more than four activities).

Procedure

The study was conducted within a community sample in New Delhi for better generalizability of the findings for factors associated with successful aging among older adults. The county selected for the study was located in the southern part of Delhi and was chosen for the purpose of this study after consulting the demographic distributions of the population of older adults in the city. The participants were selected in a systematic random sampling manner from the county's voter list provided by the Delhi Election Commission. All participants included with regards to their socioeconomic status, primarily belonged to the middle-income group. In addition, the social network pattern (living in a joint versus a nuclear family setup) was taken into consideration from the Electoral Roll obtained from the Election Commission. The participants were contacted, and informed consent was obtained. The questionnaires were administered to one (selected randomly) older adult in each household. No time limit was imposed for filling out the questionnaires; however, it was expected to require approximately 45 minutes for completion.

CHAPTER III

RESULTS

Descriptive Statistics

Data analysis included one hundred and fifty participants within the age groups of

65-75 years, with a mean age of 69.74 years. Eight other participants were excluded

from the study due to cognitive impairment (MMSE score below 23 and information

obtained from the family) and functional disability. Demographic information collected

included information regarding the participant's age, gender, marital status, living

arrangements (joint versus nuclear family), educational level, monthly income, history of

medical illnesses as well as number of visits to the physician in the past six months. All

statistical procedures are denoted with the number of participants used in each analysis

and all the data analyses are based on two-tailed tests.

Amongst the 150 participants, 76 participants lived in joint families and 74 lived in

a nuclear family setup. Network size was considered a measure for assessing the social

support network of participants living in both joint and nuclear families (See Table 1).

Since this study also attempted to replicate the findings of Chadha et al., (1996), which

found that older widowed females had lower life satisfaction and higher depressive

symptoms as compared to widowed males or married older adults, data on marital

status was obtained from all participants for this purpose. Twenty-five married males

and 31 married females constituted participants living in a joint family setup; 25 married

male and 29 married female participants lived in a nuclear family setup. In addition,

marital status indicated that 40 participants were widowed (10 males and 10 females

living in joint families; 10 males and 10 females living in nuclear families). Information on

marital status presented interesting findings, in addition to the initial hypotheses and has been discussed with respect to all measures of successful aging.

It was hypothesized that social networks for individuals living in a joint family would be larger as opposed to those living in a nuclear family setting. The network size was operationally defined as family members living with the participants, typically the participant's spouses and son's families for individuals living in a joint family system; and participant's spouses and children for those living in a nuclear family setup. Interactions with neighbors were included for both groups. Results indicated (refer to Table 1) that the mean network size of 8.46, standard deviation of 1.97 for participants in a joint family was larger than for those in a nuclear family (mean = 4.62, standard deviation = 1.02). Further, a 2X2 (network size X gender) Analysis of Variance (ANOVA) reflected significant gender differences F (1,148) = 220.847, $p < .001$ amongst participants. Male participants living in a joint family setup had a larger mean network size of 9.2 individuals as compared to 4.82 for males living in a nuclear family (See Table 1). A similar, though nonsignificant trend was seen in case of females, with those living in a joint family having a bigger mean network size of 7.82 than for females living in a nuclear family, with a mean network size of 4.43 individuals.

Post hoc Analysis

Post hoc comparisons were made using Analysis of Covariance (ANCOVA), with age being a covariate and gender, marital status and social network type being the fixed factors. Results further indicated significant differences amongst social network type, gender and marital status (F = 34.17, $p < .01$) and are presented in Table 2. Married males living in joint families showed a larger network size of 10.32 persons as

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compared to 7.41 for married females in a similar family setup. Similarly, married males in a nuclear family appeared to have a larger network size of 5.52 persons when compared with married female participants having a mean network size of 4.41 individuals (refer to Table 2). Even though the results indicate that the network size for males was larger than females regardless of family type, an interesting reverse trend was observed for widowed participants (See Table 2). Widowed females living in a joint family appeared to have a larger mean network size of 9.10 persons as compared to males, with a mean of 6.40 individuals. Similarly widowed females in a nuclear family setup had a slightly higher network size of 4.50 persons as compared to males, with a mean network size of 3.10 individuals.

Correlational Analysis

As mentioned earlier, successful aging as a construct often includes an integration of good social engagement, sense of purpose and satisfaction in life; along with maintaining physical health, cognitive capacity, and functional autonomy. It was predicted (hypothesis 2) that life satisfaction would be negatively correlated with depression and positively correlated with subjective health. A series of analyses based upon correlational relationships between successful aging constructs was performed in order to get a better understanding of the relationship between the multiple aging components (life satisfaction, subjective health, depression and leisure time activities) and educational level of participants. These predictions were examined overall with the help of a correlational matrix. The results are presented in Table 3.

As predicted, all measures were highly correlated. It was determined that there was a significant negative correlation between life satisfaction and depression levels

(Pearson's r (150) = -.904, p < .001), indicating that participants with higher sense of life satisfaction endorsed fewer depressive symptoms. Further, measures of subjective health (Pearson's r (150) = .830, p < .001), as well as leisure time activity (Pearson's r (150) = .790, p < .001) were significantly positively correlated with life satisfaction. Another interesting and novel finding that emerged from this analysis was that participant's educational status correlated significantly with all the measures, of life satisfaction (Pearson's r (150) = .497, p < .001), subjective health (Pearson's r (150) = -.904, p < .001), leisure time activity (Pearson's r (150) = .508, p < .001) as well as depression levels (Pearson's r (150) = -.559, p < .001).

Regression Prediction

Life satisfaction. Regression analyses allow us to predict group membership from a set of variables that can be continuous, discrete, or dichotomous or a mixture of the three (Tabachnick & Fidell, 2001). Regression analysis for life satisfaction (R = .946, R^2 = .896) indicated that depression levels (B = -7.304, β = -.723) and subjective health (B = 1.565, β = .177), both with t-values of p < .01, were significant predictors of life satisfaction. Leisure time activity however, was not a predictor of life satisfaction, leading to the conclusion that older adults with higher perception of subjective health as well as lower depressive levels have a higher sense of life satisfaction or a cognitive sense of satisfaction with life. Therefore, the cognitive perceptions regarding their health and fewer depressive symptoms appear to be important predictors of life satisfaction.

In addition, as before, an attempt was also made to determine if significant differences existed amongst the participants with regards to their marital status and gender (previous literature has found gender differences, i.e., Chadha et. al, 1996). Post

hoc analysis indicated that married males and females differed significantly from widowed males and females (F = 12.26, p < .001) on life satisfaction. Married males, irrespective of social network type had the highest mean life satisfaction scores, with a mean of 138.96, and standard deviation of 37.25 as compared to married females with mean life satisfaction of 119.48, and standard deviation of 37.50. Widowed males had lower mean life satisfaction scores of 101.10, and standard deviation of 27.66. Older females who were widowed not only showed the lowest sense of life satisfaction with a mean of 89.85, standard deviation of 31.03 but also appeared to have the highest levels of depression, with mean scores of 13.10 among all the above mentioned groups.

Subjective health. It was also predicted (hypothesis 3) that subjective health would be positively correlated with life satisfaction and negatively correlated with depression. These were assessed via a correlational matrix (See Table 3). Subjective health appeared to have a positive significant correlation with life satisfaction (Pearson's r (150) = .830, p < .001), leisure time activity (Pearson's r (150) = .831, p < .001) and educational status (Pearson's r (150) = .464, p < .001). Depression levels showed a significant negative correlation (Pearson's r (150) = -.866, p < .001) with subjective health indicating a poorer sense of physical and mental well being for older adults having higher depressive symptoms.

Regression analysis for subjective health (R = .890, R^2 = .793) indicated that depression levels (B = -.458, β = -.400), life satisfaction (B = 2.40, β = .212), as well as leisure time activity (B = 1.02, β = .326), all with t-values (p < .01) were significant predictors of subjective health. This results in the conclusion that older adults with higher perception of subjective health as well as lower depressive levels will have a

higher sense of life satisfaction. In addition, an attempt was made to determine gender

or marital status differences through a post hoc analysis which did not indicate a

significant difference (F = 1.430, p >.23) for subjective health with regards to either

variable.

In addition, regression analysis indicated that network size was found to be a

significant predictor for all measures of successful aging including, life satisfaction (R =

.890, R^2 = .793, B = 12.557, β = .800), depression levels (R = .661, R^2 = .436, B = -

.1.025, β = -.661), subjective health (R = .667, R^2 = .459, B = 1.025, β = .667) as well as

leisure time activity (R = .536, R^2 = .276, B = .297, β = .526) all with t-values (p < .01).

This research provided a lot of information I hoped to obtain from an analysis.

The study achieved a higher understanding of successful aging and presented a novel

finding of educational level being significantly correlated with all measures of successful

aging.

CHAPTER IV

DISCUSSION

Overview of Aging

In Asia, the aged population is increasing at a faster rate than both Europe and North America (Nayar, 2003). Thus, for Asian societies, the issues related to older adults needs immediate attention of researchers, planners, and welfare agencies. Demographic projections estimate that more than 176 million Indian citizens will be in the age group of over 60 years of age, considered the geriatric age in the country making up the second largest population of the elderly in the world and 13% of India's population by 2025 (Chadha, 1997). Despite the tremendous interest in aging, the concept remains poorly understood yet excessively theorized.

Successful aging, as mentioned earlier includes three components including low probability of disease and disease-related disability; high cognitive and physical functional capacity; and active engagement with life (Rowe & Kahn, 1997). Literature further indicates that high life satisfaction, lower depression levels, good subjective health as well as higher involvement in leisure time activity, all appear to be related to successful aging. Results indicated that lower depression levels and high perception of subjective health were significant predictors of life satisfaction in this study. In addition lower depression levels, a high sense of life satisfaction as well as involvement in leisure time activity were found to be significant predictors of subjective health. Further, bigger network size was a significant predictor of all the measures of successful aging including life satisfaction, depression levels, subjective health and leisure time activity.

Importance of Social Network Patterns

Aging takes place within a social context, with the individual belonging to a variety of kinship and social groups at each phase of the human cycle. The extent to which the older adult is enmeshed within this social network of family, friends and neighbors greatly affects their experience of aging (Rikhi & Chadha, 2004). Social network analysis is one of the many ways that the social life of the elderly can be examined. Ideally social networks can be defined as, all the people with whom the individual interacts, typically including persons who they live with as well those in categories of social identities such as neighbors, friends and colleagues at work (Van Willigen & Chadha, 1999).

Research indicates that the number that represents the size of an individual's network is a manifestation of social engagement on one hand and social isolation on the other (Van Willigen & Chadha, 1999). As expected, it was found that that the network size for participants in a joint family was larger than for those in a nuclear family. Men and women living in a joint family setup appeared to have larger social networks that those in a nuclear family setup as they lived in households that are more complex. Smaller network sizes for nuclear families can also be explained by the rapidly changing family dynamics, with young family members pursuing education, employment, and a substantial increase in the migration of adult children from home, resulting in nuclear families spreading out geographically. Further, significant gender differences were found, with married men having larger network sizes than married women. Van Willigen

and Chadha (1999) found similar gender differences with network sizes for females being smaller than those for males.

Despite gender differences, an interesting finding that emerged was that even though widowed men had smaller network sizes than married men, the network size for widowed women was slightly larger. In the Indian cultural context, males are more likely to remarry after the death of their wives and those who remain widowed are usually older and have poorer health, resulting in smaller networks. However, widowed women, especially in joint families usually have larger networks and more social support.

Life Satisfaction and Successful Aging

Life satisfaction among the elderly, operationally defined as psychological well being, is an important concept as it gives us an overall view of the adjustment as well as adaptive coping ability of the individual. Results indicated that life satisfaction showed a significant positive correlation with measures of subjective health and leisure time activity, while it was negatively correlated with depression levels. Subjective health and depression were also significant predictors of life satisfaction. Sarkisian, Hays and Mangione (2002) further found in their study that individuals with lower life satisfaction and lower expectations about aging typically do not perceive it less important to seek health care for age-associated conditions. Therefore, they experience higher levels of depression, have less energy and poor health-related quality of life.

Bradley and Fisher (1995) found that the interaction with others, life satisfaction, self-acceptance, personal growth and autonomy were important factors in successful aging. Even though, leisure time activity did not appear to be a significant predictor of life satisfaction, it was significantly correlated with the measure, indicating that

individuals involved in varied activities showed higher life satisfaction. Russell (1987) also found higher involvement in recreational activities was related to higher life satisfaction, perception of health and involvement in leisure activity.

Another interesting finding that emerged from this analysis was that participant's educational status correlated significantly with all the measures of successful aging. Literature in the filed of geriatrics has recently suggested that higher education levels appear to be a protective factor for dementia and depression. Older adults with higher educational skills have higher self-rated health, lower depression scores, higher involvement outside the home and thereby have higher satisfaction with life.

Van Willigen and Chadha (1999) found that life satisfaction was clearly associated with the extent of social engagement. Gender differences in the current study indicated that married men manifested a number of positive outcomes related to successful aging. Older women, however, experienced lower life satisfaction, less social interaction and poorer subjective health. Gaur and Kaur (2001) also found that older married men had higher life satisfaction scores than women. This could possibly be explained as a result of the patriarchal nature of Indian families (Van Willigen & Chadha, 1999), with men having more capacity to control financial assets than women. This power structure, evident in both the joint as well as nuclear families, may result in women's inability to have higher life satisfaction and subjective health ratings. In addition, older widowed women showed higher depression scores and lower life satisfaction compared to males. In the Hindu worldview, widowed women are expected to lead a chaste, austere and ascetic life. Sharma and Dak (2002) found that in the

Indian context, the loss of spouse for older women resulted in loss of status, insecurity, economic crisis and health problems for most of them.

Effects of Depression

Lower levels of depression were significantly correlated with higher life satisfaction, improved perception of self rated health and higher involvement in recreational activities. The psychosocial model of mental health posits that late-life depression results from a number of factors including, the loss of self-worth, loss of meaningful roles, declining social contacts owing to health limitations, reduced functional status, dwindling financial resources as well as a decreasing range of coping options (Reker, 1997). Research has indicated that social network size and frequency of contact are important social factors that can improve quality of life for older adults (Baxter, 1998). Previous literature has (Gada, 1982; Derasari & Shah, 1988; Raguram et al., 1996; Teja et al., 1971; Sethi, 1986) shown that depressive symptoms and disorders are more common in women, and Indian patients tend to report relatively high prevalence of somatic symptoms as compared to depressed western patients (Ganguli, et al., 1999).

Perceptions of Subjective Health

Subjective well being consists of three interrelated components of life satisfaction, pleasant affect, and depression (Diener & Suh, 1997). Health is a complex term to define and often has heavy subjective loadings. High feeling of well-being and life satisfaction also has a direct impact on domains of life such as work and leisure time activity. Perceived health appears to serve as a good indicator of current health status. Literature (Martin, Rott, Kerns, Poon & Johnson, 2000) increasingly suggests that the

link between physical and mental health is mediated by an individual's subjective health. Subjective health was found to be significantly related to life satisfaction, leisure time activity and lower depression levels, all of which significantly predicted subjective health. Asakawa, Koyano and Takattoshi (2000) also showed that social network, life satisfaction and depression are significantly affected by changes in functional health status, which was an important prerequisite for higher quality of life in older age.

Review of the literature also shows that perceived health correlates positively with more objective measures (Johnson & Wolinsky, 1993; Linn & Linn, 1980) like physical exam or physician rating (LaRue, Bank, Jarvik & Hetland, 1979), and negatively with chronic conditions (Jylhä, Leskinen, Alanen, Leskinen & Heikkinen, 1986). Qualitative analysis of the data further shows that even though older adults with lower subjective health ratings had more chronic health conditions, (hypertension being the highest reported health condition), they reported lower number of visits to the physician in the past 6 months. Sarkisian, Hays and Mangione (2002) found that lower expectations regarding aging were independently associated with decreased importance/ perception to seek health care for age-associated conditions including functional and cognitive impairment. This further relates to the importance of cognitive perceptions of health and life satisfaction as discussed earlier.

Hawley and Klaukave (1988) reported that individuals satisfied with interpersonal relationships were more satisfied and engaged in healthful practices than those who were not satisfied. Heidrich and Ruff (1993) further found that social integration and network size mediated the effects of both physical and psychological health. This was evident with both men as well as women living in joint families reporting higher ratings of

subjective health than those living in nuclear families. Therefore, social participation, social support, and loneliness have a direct impact on chronic diseases; functional status and self rated health (Sugisawa, Liang & Liu, 1994).

Involvement in Leisure Time Activities

Research indicates that participation in activities can be critical to maintain positive feelings regarding self and leisure activities can serve as a bridge between pre and post retirement life (Atchley, 1971). Leisure activities are affected not only by differences in age but also by perception of health, social support, and education in an individual's life cycle. Leisure time activities were classified into cultural, physical, social and solitary activities. Older adults participating in a higher number of activities reported significantly lower depression levels, higher ratings of subjective health, higher life satisfaction, and better educational status. Even though no significant gender differences were found, the number of activities for men was higher than those for women. Mobily, Leslie, Kemke and Wallace (1986) reported that women were more apt to participate in home centered activities and men more likely to be involved in outdoor pursuits.

Further, it was also found that older adults in joint families reported higher mean number of activities than those living in nuclear families. It was seen that older adults living in smaller networks as well as those who were widowed were more often involved in solitary activities, thereby, also explaining the higher levels of depression and lower satisfaction with life. Since leisure time activity was found to a significant predictor for subjective health, it can imply that participation in leisure activities could predict maintenance or even increases in health and physical functioning of older adults.

Everard, Lack, Fischer and Baum (2000) found that leisure activities predicted increased psychological well being and lower depressive symptoms. Therefore, helping older adults to maintain participation in informal leisure pursuits has important implications for promoting well being in later life (Janke & Davey, 2006).

In conclusion, the present results suggest that life satisfaction, social engagement, subjective health and leisure time activities, have significant positive correlations with each other and significant negative correlations with depression levels, thereby being good measures for successful ageing. In the study, life satisfaction, depression levels and leisure time activities were all significant predictors for subjective health. The results indicated that married males living in joint families reported the highest levels on all measures and significant gender differences were found on life satisfaction and subjective health. In addition, widowed women showed the highest levels of depression, which related to their lower life satisfaction, poor ratings of health and low involvement in leisure activities. A novel finding was that educational level was significantly correlated with all measures of successful ageing. Even though this study was one of the first of its kind to combine all the measures of successful ageing in an urban Indian population, more research still needs to be performed to examine more age related variations as well as to increase generalizability of results to a larger population. A cross-cultural study could further reveal interesting findings related to successful aging.

Table 1

Network Size (Means ± SD) for Male and Female Participants Living in Joint and Nuclear Families

Gender	Social Network Type	N	Network Size
Male	Joint	35	9.2 ± 2.45
	Nuclear	35	4.82 ±1.31
Female	Joint	41	7.82 ± 1.13
	Nuclear	39	4.43 ± 0.64
Total	Joint	76	8.46 ± 1.97
	Nuclear	74	4.62 ± 1.02
	Total	150	6.56 ± 2.48

Table 2

Measures of Successful Aging (Means ± SD) for Male and Female Participants Living in Joint and Nuclear Families with Different Marital Status

Gender	Marital Status	Social Network Type	Network Size	Life Satisfaction	Depression Levels	Subjective Health	Leisure Time Activity
Males	Married	Joint (*N* =25)	10.32 ± 1.95	175.12 ± 8.12	2.40 ± 1.29	23.88 ± 3.32	5.56 ± 1.29
		Nuclear (*N* =25)	5.52 ± 0.65	102.80 ± 6.57	9.08 ± 0.57	14.16 ± 1.81	3.40 ± 0.57
	Widowed	Joint (*N* =10)	6.40 ± 0.70	127.50 ± 6.09	8.00 ± 1.49	15.10 ± 1.97	3.90 ± 0.31
		Nuclear (*N* =10)	3.10 ± 0.87	74.70 ± 5.41	12.80 ± 1.47	13.00 ± 2.16	2.50 ± 0.84
Females	Married	Joint (*N* =31)	7.41 ± 0.88	154.74 ± 7.73	5.93 ± 0.85	17.09 ± 1.44	4.52 ± 0.88
		Nuclear (*N* =29)	4.41 ± 0.62	81.80 ± 7.23	9.96 ± 2.09	13.80 ± 2.09	3.20 ± 0.94
	Widowed	Joint (*N* =10)	9.10 ± 0.87	119.40 ± 6.63	10.60 ± 1.42	14.20 ± 1.39	3.00 ± 0.81
		Nuclear (*N* =10)	4.50 ± 0.70	60.30 ± 6.94	15.60 ± 2.22	10.20 ± 1.93	1.60 ± 0.69

Table 3

Correlational Analysis for Measures of Successful Aging

	Educational Status	Life Satisfaction	Depression Levels	Subjective Health	Leisure time Activity
Educational Status	1				
Life Satisfaction	.497**	1			
Depression Levels	-.559**	-.904**	1		
Subjective Health	.464**	.830**	-.866**	1	
Leisure time Activity	.508**	.790**	-.845**	.831**	1
N	150	150	150	150	150

Note: N = 150, ** All values are significant at *p* < .001.

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