

SELF-MANAGEMENT OF CHRONIC CONDITIONS AND HEALTHY LIVING: A STUDY ON THE CHRONICALLY ILL OLDER ADULTS IN URBAN LAHORE, PAKISTAN

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ABSTRACT: The present paper is an attempt to investigate whether or not self-management of chronic conditions is related with healthy living of the chronically ill older persons in urban Lahore. This paper is the part of author's PhD research. The findings of the present study indicated that self-management of chronic conditions was associated with functional health status of the study population. However, socio-economic status of the respondents was significantly related with self-management of chronic conditions. In terms of relative importance, educational attainment of the respondents among other indicators of socio-economic status turned out cardinal in determining self-management of chronic conditions. This finding underscored the importance of education for self-management of chronic conditions. Alternatively, education influences functional health status in old age.

Key words: ADL, Chronic Conditions, Disability, Functional Independence, Activities of Daily Living (ADL), Instrumental Activities of Daily Living (IADL), Self-management of Chronic Conditions.

INTRODUCTION

Chronically ill people usually do not enjoy the same health status as that of pre-morbid state (Field and Kelly 2003). Chronic illnesses are long term conditions which produce impairment (Charmaz 2007). However, some chronic conditions may not be serious and cause few problems. Others (such as cancer, AIDS and heart diseases) may impose severe challenges for functional independence (Albert 2004). As individuals grow older, they are more prone to frailty (Albert 2004; DiBello et al. 1993) and declining physical strength (Bray 1979; Frontera et al. 1991; Reed et al. 1991) which in turn contributes to a reduction in the overall quality of life of older people (Buchner et al. 1996). Presence of chronic condition debilitates functional health status of the older people. Alternatively, functional limitation (difficulty to perform everyday self-maintenance tasks independently) increases the risk of suffering from multiple chronic ailments (Jette 1996; Albert 2004). According to Center on an Aging Society (2003), individuals with multiple conditions are more likely to report difficulty in performance of daily living activities.

However, older people may enjoy active lives with chronic ailments. Behavioral changes can effectively address the challenges of impairment produced by chronic conditions (Bould et al. 1989; Stein and Potkanowicz 2003). A variety of health behaviors may be identified to cope with functional dependence that relates to either physical or mental deficits resulted from chronic conditions. Self-management of chronic conditions is one of the effective coping strategies (Albert 2004) and has positive impact on physical and psychological health of individuals (Clark et al 1991).

Self-management has contextual connotation. Various researchers have defined self-management differently in terms of particular context. For example, Creer et al. (1976) and Alderson et al. (1999) referred to individual participation in certain type of education and adult learning toward medically managed care. Others (for example, Nakagawa-Kogan et al. 1988) define self-management as "a treatment that combines biological, psychological and social intervention techniques with a goal of maximal functioning of regulatory processes". Lorig (1993) defined self-management in terms of learning and practicing skills necessary to carry on an active and emotionally satisfying life in the face of a chronic condition. The Expert Patient Approach (National Health Services, UK 2001) uses the term self-management as "any formalized patient education program aimed at providing the patient with the information and skills necessary to manage their condition within the parameters of the medical regime".

In other words, self-management is related to adoption of specific behaviors, which in turn enhance individual's ability to reduce the physical and emotional impact of illness regardless of personal training and education. Gruman and Von Korff (1996) noted that "the individual engages in activities that protect and promote health, monitors and manages symptoms and signs of illness, manages the impact of illness on functioning, emotions and interpersonal relationships and adheres to treatment regimens". Therefore, self-management refers to the individual's ability to manage symptoms, treatment, physical and psychosocial consequences and life style changes inherent in living with a chronic condition.

Given the importance of self-management of chronic conditions in reducing the impairment in

independent completion of everyday tasks, the present research was an attempt to ascertain as to how older people actually manage their chronic illnesses and whether self-management of chronic conditions helped the sampled population to survive to an advanced age with functional independence i.e., healthy living.

Some researchers, for example Albert (2004) documented the importance of self-management at household level. Therefore, self-management of chronic conditions in the present study referred to the specific behaviors that individual undertakes to control the illness, reduce the impact on physical and psychosocial health in collaboration with health care provider. In other words, self-management involves some autonomy on the part of chronically ill older person in decision making. It includes recognizing and responding to symptoms, monitoring chronic ailment, maintaining diet, managing relations, managing psychological response to illness, stress management and maintaining physical activity and compliance with prescribed medication (Clark, et al.1991).

MATERIALS AND METHODS

The data of the present study were collected from a randomly selected sample of 921 respondents (483 males and 438 females) aged 50 years and above from the households of six localities of City District Lahore in 2006 for PhD dissertation. Information was attained about self-reported medically diagnosed chronic ailments and their management in the study population. These chronic conditions included heart diseases, high cholesterol, high blood pressure, diabetes, arthritis, lung disease and self-management of these chronic illnesses, in the present study, was assessed through following indicators:

1. Managing symptoms and signs of illness
2. Seeking treatment
3. Adherence to treatment regimens
4. Monitoring health conditions
5. Effective interaction with physicians
6. Psychological response to illness
7. Depression management
8. Exercise and physical activity
9. Stress management
10. Management of family relationships
11. Management of emergencies

For the purpose of constructing a score index for self-management of chronic conditions, the response categories were quantified by giving a score to each item or question measuring self-management of chronic condition(s). The total self-management score was calculated by summing up scores on the items of the questions designed to measure self-management of chronic conditions. On the basis of total score, respondents were classified into three categories by

applying the specific range of score. The range of scores was determined by dividing the sample into three parts; third of the cases with lowest score, another third of the cases with medium scores, and top third with the highest scores. This range of scores was calculated by looking into the cumulative percentage closer to 33 percent (a third of cases), 66 percent to get the next third cases and 67 and above percentage to get the top third cases. This scaling procedure is open to criticism. But collapsing categories in this way also has the advantage of letting the data define what is low, medium or high rather than imposing some external, unrealistic definition (deVaus 1995, p.281).

Data were also collected about disability in sample population. Disability is highly contested concept. It may be identified and assessed at various levels including (i) body level (impairment), (ii) individual level (activity) and (iii) societal level (participation) [WHO 2002]. In other words, disability covers impairment in physical strengths and everyday self-maintenance activities (classified as activities of daily living – ADL; and instrumental activities of daily living-IADL). Everyday self-maintenance tasks are considered central indicators of disability (Albert 2004). Impairment in everyday activities indicates cognitive and motor deficits to carry out work-a-day routine activities. Loss of these competencies affects disability at individual (activity) and societal (social participation) levels (Albert 2004). Therefore, disability was measured in terms of self-reported difficulties with ADL (eating, bathing, dressing and using toilet) and IADL (doing light housework, such as washing dishes, light cleaning; doing heavy housework, such as washing clothes or cleaning floor; using telephone; preparing own meal and going out for shopping) due to chronic ailment(s).

Although ADL and IADL are important measures of disability (Albert 2004), it is difficult to sum up the scores of respondents in ADL and IADL domains because people might be similar in overall score but markedly differ on particular items covered in the two domains. Therefore, sum of scores of self-reported difficulties of respondents in each of ADL and IADL domains were calculated to see the relationship with self-management of chronic conditions by the study population.

RESULTS

Socio-economic Profile of the Respondents: This section provides information about the socio-economic and demographic profile of the older people across different localities of city district Lahore. The data in Table 1 shows that a substantial proportion of respondents with slightly greater proportion of females (47.3 percent) compared to that of males (41.6 percent) was aged 50-59 years. Such a gender difference could be

expected in societies like Pakistan where women are usually younger than men at the time of marriage. Overall, smaller proportion of respondents was aged 70+ years. It might be attributed to increasing life expectancy of the individuals which is less compared to that of developed countries.

Marital status is considered important in determining psychological and emotional health of the people in later years. Availability of spouse might be a significant source of support in later years of life. A

marriage relationship can provide affection and a sense of belonging. This valuable support is lost upon widowhood (Victor 1994). Table 1 shows percent distribution of respondents by gender, age, and marital status. Out of the total 483 male respondents, 86.7 percent were currently married, while only 12.0 percent of them were widowed. Out of total 438 female respondents, 62.1 were currently married and 36.5 percent were widowed. Only tiny proportions (0.2 percent) of male and female respondents were divorced.

Table 1 Percentage distribution of respondents by gender, age, marital status and socio-economic status

| Marital Status | | | | | | | |
|-----------------------|----------------|-------------------|-------------|-------------|--------------|---------------|--------------|
| Gender | Age (in Years) | Currently Married | Widowed | Separated | Divorced | Never Married | Total |
| Male | 50-59 | 38.7 | 1.9 | 0.0 | 0.2 | 0.8 | 41.6 |
| | 60-69 | 29.0 | 2.1 | 0.0 | 0.0 | 0.0 | 31.1 |
| | 70-79 | 14.5 | 3.7 | 0.0 | 0.0 | 0.2 | 18.4 |
| | 80 and above | 4.6 | 4.3 | 0.0 | 0.0 | 0.0 | 8.9 |
| | Total | 86.7 | 12.0 | 0.0 | 0.2 | 1.0 | 100.0 |
| | N | 419 | 58 | 0.0 | 1 | 5 | 483 |
| Female | 50-59 | 34.7 | 11.6 | 0.2 | 0.2 | 0.5 | 47.3 |
| | 60-69 | 16.0 | 11.0 | 0.0 | 0.0 | 0.2 | 27.2 |
| | 70-79 | 9.4 | 8.4 | 0.0 | 0.0 | 0.2 | 18.0 |
| | 80 and above | 2.1 | 5.5 | 0.0 | 0.0 | 0.0 | 7.5 |
| | Total | 62.1 | 36.5 | 0.2 | 0.2 | 0.9 | 100.0 |
| | N | 272 | 160 | 1 | 1 | 4 | 438 |
| Socio-economic Status | | | | | | | |
| Gender | Age (in Years) | Low | Medium | High | Total | | |
| Male | 50-59 | 14.1 | 9.9 | 17.6 | 41.6 | | |
| | 60-69 | 9.1 | 7.2 | 14.7 | 31.1 | | |
| | 70-79 | 6.8 | 4.1 | 7.5 | 18.4 | | |
| | 80 and above | 4.1 | 1.2 | 3.5 | 8.9 | | |
| | Total | 34.2 | 22.6 | 43.3 | 100.0 | | |
| | N | 165 | 109 | 209 | 483 | | |
| Female | 50-59 | 20.3 | 13.2 | 13.7 | 47.3 | | |
| | 60-69 | 13.7 | 8.7 | 4.8 | 27.2 | | |
| | 70-79 | 7.8 | 6.2 | 4.1 | 18.0 | | |
| | 80 and above | 4.3 | 2.7 | 0.5 | 7.5 | | |
| | Total | 46.1 | 30.8 | 23.1 | 100.0 | | |
| | N | 202 | 135 | 101 | 438 | | |

The percentages of female widowed across all age groups were greater than those of males. It indicates that a large proportion of widows might have to face more isolation and ordeal compared to their married counterparts. Womanhood and widowhood may jeopardize social, economic and psychological status of females more than their male counterparts in later years of life. Widowed demonstrate higher rates of mortality, morbidity and self-reported ill health (Victor 1994). Percentages of divorced or separated respondents were small. One may argue that people could be less likely to

divorce or separate in older ages because they may need their spouses to take care of each other.

Socio-economic status has strong bearing on one's health status in late years of life. Socio-economic status influences many aspects of people's lives, including their access to health and other services. With the increase in age, older adults scored low on socio-economic variables (education, occupation, monthly income and consumer durables). It is understandable that income levels reduce with increase in age due to retirement or less involvement in income generating activities due to physical frailty. Overall, elderly

respondents seemed to score low socio-economic variables.

However, gender differentials indicate that older females were more deprived and scored less on socio-economic variables compared to their male counterparts. It might have implications for their health and well-being.

Prevalence of Medically Diagnosed Chronic Ailments and Impairments in Everyday Maintenance Tasks: Chronic conditions are, by definition, long-term and do not usually require curative treatment. Medical intervention may or may not alleviate the associated symptoms. Chronic health conditions are said to increase the burden of disease for the families and pose severe challenges in old age. Table 2 shows that significant proportions of respondents were afflicted with listed chronic conditions. The data show high prevalence of hypertension (51.6 percent) in the study population followed by arthritis (43.1 percent), diabetes (25.4 percent), high cholesterol (18.0 percent) and heart diseases (12.2 percent).

Although genetic make-up influences the onset of various chronic ailments; high prevalence of diabetes, cholesterol, blood pressure and heart diseases could largely be attributed to lifestyle, such as less exercise and changing diet patterns (Leeder et al 2004). One may also argue that malnutrition in early life, lack of access to adequate health care, and exposure to unsafe environmental conditions among other factors could be responsible for greater prevalence of listed chronic conditions in the study population.

Table 2 Percent distribution of respondents by self-reported chronic conditions and impairments in activities of daily living

| Self-reported Medically Diagnosed Condition | | (N= 921)% |
|--|--|--------------|
| Heart attack | | 12.2 |
| Angina | | 12.2 |
| High blood pressure | | 51.6 |
| High cholesterol | | 18.0 |
| Diabetes | | 25.4 |
| Arthritis/Joint pain | | 43.1 |
| Self-reported Impairments in Everyday Self-maintenance Activities | | |
| <i>Impairment in ADL Domain</i> | | |
| No difficulty in ADL activities | | 48.8 |
| Difficulty in 1 ADL activity | | 21.7 |
| Difficulty in 2+ ADL activities | | 29.5 |
| Total | | 100.0 |
| <i>Impairment in IADL Domain</i> | | |
| No difficulty in IADL activities | | 43.2 |
| Difficulty in 1 IADL activity | | 15.4 |
| Difficulty in 2+ IADL activities | | 41.4 |
| Total | | 100.0 |

According to Disabled People's International (1982), disability refers to impairment or functional limitation caused by physical, mental or sensory loss. Disablement model explains disability in terms of self-reported difficulty in performing everyday tasks because of functional limitation (i.e., impairment) [Albert 2004].

WHO (2001) in its revised model (International Classification of Functioning, Disability and Health) explained disability in terms of activity limitation and participation restriction. It clearly indicates that functional limitation (impairment in everyday self-maintenance activities) is widely used indicator of disability.

Table 2 also provides information about impairment in everyday self-maintenance (ADL and IADL) tasks. Out of the total 921 respondents, 48.8 percent had no difficulty in performing ADL tasks; 21.7 percent of the total respondents had one difficulty in ADL domain, while 29.5 percent of the total respondents had 2+ difficulties in ADL sphere. It is necessary to mention here that 2+ difficulties in ADL capabilities were more prevalent in the respondents from lower and middle socio-economic neighborhoods of city District Lahore.

The data in Table 2 shows that 43.2 percent of the total 921 respondents reported no difficulty in any activity under reference in IADL capabilities, while 15.4 percent of the total respondents had difficulty in one of the tasks of IADL domain. It is interesting to note that greater proportion of respondents (41.4 percent) reported 2+ difficulties in IADL domain compared to that of respondents (29.5 percent) who had 2+ difficulties in ADL competencies.

However, over reportage of difficulties in IADL capabilities might partly be attributed to culture and gender specific responses to the items covered in IADL sphere (such as going out for shopping, preparing meals, washing clothes and cleaning floor). However, significant proportions of respondents were impaired in both ADL and IADL capabilities.

Self-management of Chronic Conditions: Self-management is strategic within different contexts. Therefore, one needs specificity in usage. Sometimes self-management is equated with self-care, but it is not appropriate term because most chronic conditions demand full involvement of medical practitioners and application of the accepted therapeutic regimes (Clark 2003).

Therefore, self-management, in the present study, is used to refer to the tasks that an individual undertakes to live well with one or more chronic conditions. This definition entails adoption of specific behaviors needed to reduce the physical and emotional impact of illness regardless of personal training and education. Individual monitors and manages symptoms of

illness, manages interpersonal relationships and adheres to treatment regimens.

Alternatively self-management implies life style changes with the active involvement of care provider to minimize the impact of chronic conditions on physical and cognitive capabilities. Table 3 presents overall percent distribution of respondents by their level of self-management of their chronic conditions. The level of self-management has been calculated from the master index score of self-management of chronic conditions.

Table 3 Percent distribution of respondents by level of self-management

| Level of self-management of chronic condition | Frequency | Percent |
|---|------------|--------------|
| Low Self-management | 320 | 34.7 |
| Medium level of Self-management | 305 | 33.1 |
| High level of Self-management | 296 | 32.1 |
| Total | 921 | 100.0 |

The data in Table 3 show that nearly one-third of the respondents had low, medium, and high levels of self-management about their chronic conditions. This is an interesting division and shows an 'even' spread of respondents.

Level of self-management of chronic conditions was significantly associated with respondents' socio-economic status. The findings from Table 4 clearly show a robust positive association between the variables.

Table 4 Level of Self-management of chronic conditions by level of S.E.S

| Level of Self-management of chronic conditions | Level of S.E.S | | | Total |
|--|----------------|------------|------------|------------|
| | Low | Medium | High | |
| Low | 196 | 92 | 32 | 320 |
| Medium | 115 | 91 | 99 | 305 |
| High Self- | 56 | 61 | 179 | 296 |
| Total | 367 | 244 | 310 | 921 |

Chi square value=192.019; df=4; P≤0.001

Although socio-economic status of the respondents was found to be an important factor in influencing self-management of chronic conditions, age and gender were also important contributors in this regard. Regression analysis was run to examine how far age, gender, work status (working/non-working status), monthly income, educational attainment, and possession of consumer durables accounted for the variance in explaining self-management of chronic conditions.

Table 5 presents summary statistics about regression analysis for self-management of chronic conditions. The results of regression analysis for self-

management of chronic conditions show that altogether all the variables (taken into account) explained about 24.0 percent variance. The data in Table 5 shows that educational attainment explained the largest proportion of variance, while age explained the lowest amount of variance. This is an important finding that age was not a barrier in self-management of chronic conditions.

There might be other factors, which could have interactive effect on age for low self-management of chronic conditions. Self-management was significantly related with gender, work status, monthly income, educational attainment and possession of consumer durables. However, educational attainment has been found the most important contributing factor in explaining more variance for self-management of chronic conditions (i.e., 15.8 percent) followed by the possession of consumer durables (15.5 percent), monthly income (10.8 percent), gender (8.0 percent) and work status (2.4 percent) respectively.

Table 5 Univariate Regression analysis- Summary Statistics Dependent Variable: self-management of chronic conditions

| Variables | R Square | β | t-Value | Significance |
|---------------------------------|-------------|---------|---------|--------------|
| | 0.24 | | | |
| Age | 0.001 | - | -0.684 | 0.001 |
| | | 0.00180 | | |
| Gender | 0.080 | -0.464 | 8.962 | 0.001 |
| Work status | 0.024 | 0.259 | 4.798 | 0.001 |
| Monthly income | 0.108 | 0.02766 | 10.571 | 0.001 |
| Education | 0.158 | 0.175 | 13.118 | 0.001 |
| Possession of consumer durables | 0.155 | 0.07377 | 12.960 | 0.001 |

R. Square value for all variables

Table 6 shows data regarding null hypothesis: 'there was no association between level of self-management of chronic conditions and ADL impairments'. The cross classification of the data bearing upon this hypothesis shows that 63.2 percent of the respondents with high self-management of chronic conditions had no impairment in ADL tasks, while 56.6 percent of the respondents with low self-management had difficulty in 2-3 tasks of ADL domain. The findings show that the association between independent and dependent variables was statistically significant and in the predicted direction. The statistical value of gamma (-0.504) shows negative association between the variables, which implies 'the more one manages chronic conditions, the lesser one is impaired in ADL activities'. Although the association

between independent and dependent variables was statistically significant, the strength of the relationship was moderate.

Table 7 presents data regarding null hypothesis that there was no association between self-management of chronic conditions and IADL impairments. It indicates that the association between independent and dependent variables was statistically significant and in the predicted direction. The statistical value of gamma (-0.437) shows negative association between the variables. The findings of the test results clearly indicate that self-management of chronic conditions was significantly associated with the independent completion of everyday maintenance tasks of the older adults.

Table 6 Impairments in ADL capabilities by level of Self-management

| Impairments in ADL activities | Level of Self-management | | | |
|-------------------------------|--------------------------|--------------|--------------|--------------|
| | Low | Medium | High | Total |
| No impairment | 27.5 | 44.9 | 75.7 | 48.8 |
| Difficulty in 1 ADL task | 30.0 | 21.0 | 13.5 | 21.7 |
| Difficulty in 2-3 ADL tasks | 42.5 | 34.1 | 10.8 | 29.5 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |
| N | 320 | 305 | 296 | 921 |

Chi square calculated value= 149.439; df = 4; P≤ 0.001;
Gamma Value= -0.504 P≤ 0.001

Table 7 Impairments in IADL capabilities by level of Self-management

| Impairments in IADL activities | Level of Self-management | | | |
|--------------------------------|--------------------------|--------------|--------------|--------------|
| | Low | Medium | High | Total |
| No impairment | 26.9 | 41.0 | 63.2 | 43.2 |
| Difficulty in 1 IADL task | 16.6 | 11.8 | 17.9 | 15.4 |
| Difficulty in 2-3 IADL tasks | 56.6 | 47.2 | 18.9 | 41.4 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |
| N | 320 | 305 | 296 | 921 |

Chi square calculated value=107.896; df = 4; P≤ 0.001;
Gamma Value= -0.437; P≤ 0.001

DISCUSSION

Most of the countries across globe are experiencing population ageing due to reduced fertility levels and increasing life expectancy. A corollary issue of population ageing is the increasing prevalence of chronic conditions and disabilities. Living longer with good functional status (healthy ageing) demands clinical and

psychosocial coping strategies. Self-management of chronic illnesses has been recognized as an important strategy that entails clinical as well as psychosocial aspects of health. The under reference chronic conditions are deemed to produce impairment in daily living activities of older adults. Given the serious repercussions of the listed chronic ailments, the present research was carried out to assess the influence of self-management of chronic conditions on impairment in daily living activities of sampled population.

The findings of the present study revealed that significant proportions of respondents were afflicted with chronic ailments and impaired in ADL/IADL domains of health. Although it was beyond the scope of the present research to identify complex etiologic agents responsible for chronic diseases and impairments in daily living activities, living longer with good functional status would pose a serious challenge for Pakistan in the years to come. The findings of the present research clearly warrant policy interventions to reduce the lifestyle diseases (such as diabetes and hypertension) through pertinent education and health promotion programs. Such a strategy might help reduce the number of disabled people in Pakistan in the years to come. Overall, the results supported the hypothesis that the respondents who managed their chronic conditions were less impaired in activities of daily living than those who did not. However, self-management of chronic conditions was largely determined by education of the respondents. It clearly implies that education plays an important role in healthy ageing. Clark et al (1991) noted that successful self-management of chronic ailments involves three important components: individual's level of knowledge about chronic condition that shapes his/her decisions to seek treatment; life style changes (such as exercise and physical activity); and the skills needed to manage psychosocial functioning. Hence, it could be argued that education helps achieve these components for successful self-management apart from personal and environmental factors. Therefore, policy interventions are needed to enhance gross enrolment ratio and improve literacy rate in Pakistan. Such a strategy could help achieve healthy growth of Pakistani society.

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REFERENCES

Alam, M. South Asian Elderly: ADL and IADL Statuses of the Elderly in India. A Preliminary

Investigation. Delhi: Population Research Center, Institute of Economic Growth, India (2005).

Albert, S. M. *Public Health and Aging, An Introduction to Maximizing Function and Well-being*. New York: Springer Publishing Company, Inc (2004).

Alderson, M., and Starr, L., et al. The Program for Rheumatic Independent Self-management: A Pilot Evaluation. *Clinical Rheumatology*. 18: 283-292 (1999).

Barlow, J., and Wright, C., et al. Self-management Approaches for People with Chronic Conditions: A review. *Patient Education and Counseling*. 48: 177-187 (2002).

Bould, S., Sanborn, B. and Reif, L. *Eighty-Five Plus: The Oldest Old*. Belmont, CA: Wadsworth (1989).

Bray, G. (Ed). *Obesity in America*. Washington, DC: Department of Health, Education, and Welfare (1979).

Buchner, D., and Larson, E., et al. Evidence for a Non-linear Relationship Between Leg Strength and Gait Speed'. *Age and Ageing*. 25: 386-391 (1996).

Center on an Aging Society. *Data Profile on Multiple Chronic Conditions*. Institute for Health Care Research and Policy. Washington, DC: Georgetown University (2003).

Charmaz, K. "Chronic Illness and Disability." In: *The Blackwell Encyclopedia of Sociology*, Volume (II), G. Ritzer, ed. Malden: Blackwell Publishing, 479-482 (2007).

Clark, N. M. Management of Chronic Disease by Patients. *Annual Review of Public Health*. 24: 289-313 (2003).

Clark, N. M., et al. Self-management of Chronic Conditions by Older Adults: A Review and Questions for Research. *Journal of Aging and Health*. 3(1): 3-27 (1991).

Creer, T., Renne, C., and Christian, W. Behavioral Contributions to Rehabilitation and Childhood Asthma'. *Rehabilitation Literature*. 37:226-232, 247 (1976).

de Vaus, D. A. *Surveys in Social Research*. London: Routledge (1995).

DiBello, V. F., and Lattanzi, E., et al. Left Ventricular Performance and Ultrasonic Myocardial Quantitative Reflectivity in Endurance Senior Athletes: An Echocardiographic Study. *European Heart Journal*. 14: 358-363 (1993).

Field, D., and Kelly, M.P. "Chronic Illness and Physical Disability." In: *Sociology of Health and Health Care*, S. Taylor and D. Field, eds. Malden: Blackwell Publishing, 117-136 (2003).

Frontera, W. R., and Hughes, V. A., et al. A Cross Sectional Study of Muscle Strength and Mass in 45-to-78-year Old Men and Women.' *Journal of Applied Physiology*. 71: 644-650 (1991).

Gruman, J., and Von Korff, M. *Indexed Bibliography on Self-management for People with Chronic Disease*'. Washington, DC: Center for Advancement in Health (1996).

Jette, A. M. "Disability Trends and Transitions." In: *Handbook of Aging and the Social Sciences*, R. Binstock and L. George, eds. San Diego, CA: Academic Press, 129-117 (1996).

Leeder, S., and Raymond, S., et al. *A Race against Time, the Challenges of Cardiovascular Disease in Developing Economies*. New York: Trustees of Columbia University (2004).

Lorig, K. *Self-management of Chronic Illness: A Model for the Future*'. *Generations*. XVII (3): 11-14 (1993).

Nakagawa-Kogan, H., and Garber, A., et al. Self-management of Hypertension: Predictors of Success in Diastolic Blood Pressure Reduction. *Research in Nursing and Health*. 11: 105-115 (1988).

National Health Service. *The Expert Patient: A New Approach to Chronic Disease Management for the 21st century*. London, UK: Department of Health (2001).

Rantanen, T., and Guralnik, J.M., et al. Disability, Physical Activity, and Muscle Strength in Older Women: The Women's Health and Aging Study. *Archives of Physical Medicine and Rehabilitation*. 80(2): 130-135 (1999).

Reed, R. L., and Pearlmuter, L., et al. The Relationship between Muscle Mass and Muscle Strength in the Elderly'. *Journal of the American Geriatric Society*. 39: 555-561 (1991).

Stein, H., and Potkanowicz, E. S. Behavioral Determinants of Healthy Aging: Good News for the Baby Boomer Generation. *Online journal of Issues in Nursing*. www.nursingworld.org/ojin/topic21 accessed on March 15, 2007 (2003).

Tinetti, M. E., Speechley, M. and Ginter, S. F. Risk Factors for Falls among Elderly Persons Living in the Community. *The New England Journal of Medicine*. 319(26): 1701-1707 (1988).

Victor, C. R. *Old Age in Modern Society*. London: Chapman and Hall (1994).