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Effect factors of long-term care utilization of elderly stroke patients in Taiwan

Chang, Sue-Ing, Ph.D.

Case Western Reserve University, 1993
EFFECT FACTORS OF LONG-TERM CARE UTILIZATION
OF ELDERLY STROKE PATIENTS IN TAIWAN

BY

SUE-ING CHANG

Submitted in partial fulfillment of the requirements
for the Degree of Doctor of Philosophy

Thesis Advisor: Dr. Kathleen Farkas

Mandel School of Applied Social Sciences
CASE WESTERN RESERVE UNIVERSITY
January, 1993
Effect Factors of Long-term Care Service Utilization by Elderly Stroke Patients in Taiwan

Abstract

by

Sue-Ing Chang

Health care policy in Taiwan has shifted from a focus on the care of short-term acute illness to prevention and long-term care of chronic illness. To date, there have been very few studies of long-term care services or of the people who use these services in Taiwan. This study uses the conceptual framework developed by Andersen and Newman (1973) and adapted by Bass and Noelker (1987) to study long-term care service utilization in a sample of Taiwanese elderly stroke patients. Research using these models in the United States and other Western industrialized countries has found that there are sets of predictor variables which explain the use of formal and informal care. These models, however, have not been tested empirically in Taiwan. Given the growth in the elderly population in Taiwan and the increased need for long-term care services, there is a need to understand the factors
which influence the use of both formal and informal care services of people who suffer chronic illness and disability. The purpose of this study is to test the applicability of these models with a sample of Taiwanese elderly and their caregivers and to develop a line of service utilization research for long-term care services in Taiwan.

A simple random sample was drawn from a registry of stroke patients who had been discharged from the hospital following a stroke. The study sample included 103 caregivers of these elderly Taiwanese who lived in Taipei metropolitan area. Respondents were interviewed over the telephone. The response rate for the study was 98%. Respondents were asked questions about their elder’s use of formal and informal care services, their own attitudes toward using formal and informal care, the characteristics of the elder, characteristics of themselves, and their levels of satisfaction with the care available and the care received.

The data were analyzed by chi-square tests to learn the association between each predictor and the use of care. The five predictors that achieved or approached significance were included in the multivariate logistic regression. Results of bivariate analysis
showed that the number of generations, household income, activities of daily living (ADL), and caregiver’s educational level are significantly associated with the use of formal care. However, multivariate analysis showed that when all five predictors were entered, only household income and ADL were significantly associated with the use of formal care.

While this study’s findings are limited to stroke patients with caregivers willing to be interviewed, it did show that the conceptual frameworks used in western studies can be applied to urban Taiwanese populations. The degree to which families and elders accept formal care options and the ways in which they learn about and gain access to these services is an area which needs further study. The study’s findings highlight the need for social work practitioners in Taiwan to focus on the needs of the disabled elderly and their families, to develop programs to meet their needs, and to become active in developing long-term care policy initiatives which will improve and strengthen the Taiwanese family.
PREFACE

The Ph.D. is more than a degree to me. At the beginning of the Ph.D. program, I thought people who wanted to finish were those who had the potential to accomplish it. However, at the end of the study, I realized that Ph.D. is a function of social support and personal effort.

I am grateful to those elderly stroke patients and their families with whom I have worked. The experiences they shared with me motivated me toward further study and the completion of this dissertation. My sincere thanks also go to the government of Republic of China and Veterans General Hospital, Taipei. Without their support, I would not have had the opportunity for advanced study.

Special thanks go to my advisor and the chairperson, Dr. Kathleen Parkas. Her input and guidance for the dissertation have been invaluable and I will never forget her ongoing understanding, tolerance and encouragement during the whole study process.

I also want to express my appreciation to Dr.
Terry Hokenstad, Dr. Sharon Milligan and Dr. Ann Roy, whose expertise made the dissertation more profound.

I have to offer my thanks to Dr. Huang and Dr Su who provided access to the Registry of Stroke Patients in Taiwan.

I especially appreciate my friends Ying-Chen, Juan-Juan, Ping and Li-Yu for their support in many ways through the dissertation writing process. Tom, George, Hammed and Philip also contributed a lot to the process of editing my dissertation.

Finally, my deepest thanks and appreciation go to my husband and two daughters. Without their ongoing support and encouragement, I could not have undertaken or completed this study.
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CHAPTER 1

INTRODUCTION

Health care policy in Taiwan has shifted from a focus on the care of short-term acute illness to the prevention and long-term care of the chronically ill elderly and disabled. It is a challenge for policy makers to respond appropriately to the burden of chronic care needs that occur with increasing prevalence in old age. Very few studies have been done in the area of long term care of the disabled elderly in Taiwan. Patterns of health care organization are shaped by history and sociocultural factors. The health care system is a cultural institution that implicitly incorporates the values, aspirations, and goals of those who organize and provide services as well as those they serve (Mechanic, 1989). The issue of long-term care exemplifies the intimate relationship between medical care and patterns of culture and social relationships. The demand for such care not only depends on levels of disability but also on household structure, norms about family and community
responsibility, and networks of reciprocal obligation (Mechanic, 1987).

In Taiwan, the health care system, especially the system of hospital care is patterned on Western medical care organization with a strong emphasis on interventionist approaches to disease. However, in the case of chronic disability, the attention on the social context is especially important in that medicine often can do no more than control pain and provide support.

Thus, at the beginning of this study, an introduction of demography, health and social condition of elderly population, and long-term care system in Taiwan will be provided in order to understand the broad context in which long-term care problem of the stroke elderly in Taiwan in existence.

A. Changes in Demography and Health Conditions of Elderly Population

The percentage of Taiwan’s population over 65 has increased dramatically during the past twenty years due to advanced medical technology, the lower birth and mortality rates, and the extended life expectancy.
Table 1 shows the change of number and percentage of elderly over 65 from 1971 to 2000. According to Directorate-General of Budget, Accounting and Statistics (DGBAS, 1990), the elderly population has more than doubled from 450,000 people or 3.02% of the population in 1971 to 1,190,000 or 5.9% in 1990. In 1985, the aged over 70 totaled 570,000, which is 58.4% of the aged over 65. In the next ten years, the aged over 65 are expected to increase at a rate of 5.4% per year, which is 2.3% beyond the growth rate of the total population. The aged population is expected to increase from 970,000 in 1985 to 1,850,000. By the year 2000, the aged are expected to comprise 8.4% of the total population in Taiwan. In addition, the over 70 year old population is estimated to reach 1,160,000 by year 2000 (The Council for Economic Planning and Development, 1986). As in most industrialized societies, the aged are predominantly female. The average age of women in 1988 was 76.60 and 71.30 for males. The 70 and over group has a greater likelihood of being frail and in need of chronic and social support.
Table 1. Number and Percentage of Elderly Over 65 in Taiwan (CEPD, 1986; DGBAS, 1990)

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>450,000</td>
<td>3.02%</td>
</tr>
<tr>
<td>1985</td>
<td>973,000</td>
<td>5.05%</td>
</tr>
<tr>
<td>1990</td>
<td>1,190,000</td>
<td>5.90%</td>
</tr>
<tr>
<td>2000*</td>
<td>1,850,000</td>
<td>8.40%</td>
</tr>
</tbody>
</table>

*estimate

The growth of the aging population will have a significant impact upon health and human services in Taiwan. Elderly persons, by virtue of their high risk of chronic disease and disability, are the primary recipients of long-term care. The policy makers have recognized the increase in demand for long-term care which was caused by the aging population of the Taiwanese in recent years.

The demographic changes in Taiwan have suggested the elderly’s increasing need for more social, financial, and medical resources. The health condition of the elderly decreases with increasing age. Table 2 shows that the percentage of healthy elderly between age 65 and 69 is
69.79%, between age 70 and 74 is 63.73%, between age 75 and 79 is 54.65%, and it is 43.70% beyond age 80. The percentage of disabled elderly increased from 3.99% between age 65 and 69 to 10.70% for persons 80 and over (DGBAS, 1988).

<table>
<thead>
<tr>
<th>age</th>
<th>total (%)</th>
<th>healthy</th>
<th>with minor disease</th>
<th>disabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-69</td>
<td>100</td>
<td>69.79</td>
<td>26.21</td>
<td>3.99</td>
</tr>
<tr>
<td>70-74</td>
<td>100</td>
<td>63.73</td>
<td>31.89</td>
<td>4.39</td>
</tr>
<tr>
<td>75-80</td>
<td>100</td>
<td>54.65</td>
<td>37.68</td>
<td>7.66</td>
</tr>
<tr>
<td>80+</td>
<td>100</td>
<td>43.70</td>
<td>45.60</td>
<td>10.70</td>
</tr>
</tbody>
</table>

Healthy indicates absence of chronic disease.
Minor disease indicates minor physical complaints which did not affect daily activities.
Disabled indicates functional impairment which needs to be cared for.

Table 3 shows the health condition of Taiwan's elderly in 1989. Thirty-seven percent of the elderly were healthy. Nearly 58% had minor illness which did not affect their daily activity. An increasing portion of the elderly (4.63%), which was estimated to be 55,000 people, were functionally impaired and needed to be cared for (DGBAS, 1990).
Table 3. Number and Percentage of Health Condition of Taiwan’s Elderly (DGBAS, 1990)

<table>
<thead>
<tr>
<th></th>
<th>total</th>
<th>healthy</th>
<th>with minor disease</th>
<th>disabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>1,188</td>
<td>444</td>
<td>689</td>
<td>55</td>
</tr>
<tr>
<td>%</td>
<td>100%</td>
<td>37%</td>
<td>58%</td>
<td>4.63%</td>
</tr>
</tbody>
</table>

Considerable interest and attention have been paid to the research concerning the elderly welfare in Taiwan (Pai, 1978, 1987; Jan, 1979; Chen and Chen, 1982; Shieh, 1982; Chang, et al., 1983; Chao, 1984; Jiang, 1984; Chen, 1985; Hwang, 1985; Hsiao, 1985; Shu, 1986; Lin, 1987; Chang, 1987). However, the predominant studies focus on the healthy, articulate and able elderly (Jan, 1986). Therefore, the findings from the above studies can only be generalized to the welfare of the healthy elderly and their families. Very few studies have emphasized the needs of the disabled and dependent elderly. Long-term care of the chronically disabled elderly has been recognized as the weakest aspect of government response to the elderly needs.
(Bureau of Social Affairs, 1987). Jan (1986) points out that research that focuses on the welfare needs of the disabled and dependent elderly is particularly sparse.

According to the 1985 Taiwan Health Department statistics, the leading cause of death of the elderly in Taiwan between age 65 and 89 was cerebra-vascular disease. The next leading cause of death between 65 and 79 was cancer and between 80 and 89, it was heart disease. These diseases cause functional impairment and daily activity limitation. Stroke, in particular, can cause individual sensory, motor, cognitive and affective functional impairment which leads to permanent disability. Among home-bound elderly, cerebral vascular disease is the major cause of being bedridden (BSA, 1987).

In a recent survey those patients most in need of home care in Taiwan had neurological disease. Of these 51.6% were stroke patients (Association of Public Health, APH 1990). A survey of stroke patients in twenty-six teaching hospitals in 1985 showed that 15,000 persons died of stroke. Seventy-five hundred stroke patients were hospitalized and 41% (3,075
patients) of these patients were 65 years and older. Eighty-three percent of these stroke patients suffered from various degrees of disability. Consequently, it is estimated there are least 2,500 patients aged 65 and over in 1985 who stayed home, or in a community or institution for long-term care (Lee, 1989). According to Lee (1988), about 52% of the private nursing home patients are stroke patients. Thus, this study of long-term care problems of the elderly who are stroke victims constitutes an important area of research about long-term care of disabled elderly.

B. Social change and family structure change

The percentage of nuclear households of the total households increased in Taiwan from 54% in 1963 to 60% in 1973 to 69% in 1976 (Sheih, 1980). Average family size in 1951 was 6 persons per household, which declined to 4.5 in 1986, and it is estimated to be 4.1 by the year of 2000 (Chiou, 1988). The shrinking family size also suggests the growth of nuclear families in Taiwan.
In a survey on the social welfare needs of the elderly and their relations to family structure in Taipei metropolitan area, Jan (1989) found that 73.8% of the interviewed elderly lived with their children. The elderly who were willing to live in welfare institutions were those with higher education and professional occupations. Older men with high education and professional education are more inclined to live on their own than older women of comparable education.

According to a report on the status survey of the elderly (DGBAS, 1990), present living arrangements were depicted regarding persons age 65 and over in Taiwan area. The findings suggested that although most of the elderly live with their children (including living with a certain child continuously and living with children in turn), the proportion decreased from 70.2% in 1986 to 65.7% in 1989. This was a 4.5% decrease in three years. The proportion living with spouse and living alone increased from 25.6% in 1986 to 31.1% in 1989 (18.17% and 12.09% separately). This was a 5.5% increase in three years.
The Chinese family is mostly stem family currently. However, from the previously mentioned data, it is evident that the Chinese society is changing more in the direction of the nuclear family under the impact of rapid social and economic change. More elderly now live alone or with their spouses. This trend also means that the availability or interest of adult children in providing elderly care has decreased.

A survey of family and social environment intention (DGBAS, 1987) conducted with males over 20 years old found that 59% would like to live with children, 40% would like to live alone or live in institutions after they retire. On the contrary, among the same subjects only 26% preferred to live with their parents after marriage, 42% were opposed to living with parents, and 32% had no opinion. In terms of the family composition pattern of the future, this result suggests a conflict between their own attitudes regarding living with parents as adults and their own living arrangement with their children. This has implications for the availability of social resources for Taiwan’s elderly. With the changing structure of
family in Taiwan it seems that it is becoming more
difficult for the elderly to live with children.

C. Family care for the aged

The Chinese family in Taiwan remains the most
fundamental unit of society. It continues to perform
traditional functions such as caring for the elderly,
although the extent has lessened considerably by the
processes of modernization and industrialization.

The obligations of children (both sons and
daughters) to take care of their elderly parents is
part of the Chinese tradition and mandatory. The
lineal descendant, by the order of closeness, has the
legal obligation to take care of the lineal ascendant.
Lineal ascendant, even if he/she is able to live on
his/her own, has the right to be cared for by the
lineal descendant. Only those childless elderly or
those whose lineal descendant can’t really afford it
could apply for general assistance or medical
assistance. The way of caregiving depends on the
agreement of family members or by the judgement of the
court (Civil Code). If the lineal descendant discards
the ascendant elderly, he commits the crime of weighted discard (Criminal Code).

Chinese used to view the elderly living in the institution as a stigma (Pai, 1978). The impact of this negative attitude toward institutionalization not only affects the elderly, but also the family’s decision making about long-term care. However, Yu (1987) found that the filial behaviors are determined by factors such as economic condition, the way of care-taking, and conflict in the family relationship. The tradition of valuing the elderly in Chinese culture through respect and caring for them is gradually diminishing under the impact of individualism and industrialization. According to Shieh (1980), economic, geographic and social distance between generations effect family relationship. Economics, geography and social mobility have increased generation distance in Taiwan since 1950 and decreased children’s dependency on parent’s property, thus shaking the economic base of paternity (Chang, 1983). Compounding the problem is that, according to an estimation by Lin (1987), economic burden for parent care will triple by the year of 2035. Traditional filiality is expected to
face the challenge of economic burden. How parents care will be affected by their children’s economic condition, especially when the elderly move from the status of health to the status of illness and become more dependent on their children is worthy of our further attention.

Women’s participation in the Taiwanese labor market has increased during the past ten years from 31.42% in 1981 to 42.66% in 1988. Since the family caregivers in Taiwan most often are daughters, daughters-in-law, or wives, the increasing number of working women means that available caregivers for the chronically impaired will decrease. In the U.S., research shows that increased participation of women in the labor force has made institutionalization more likely for those who otherwise would have been cared for by adult children (Wetle & Pearson, 1986).

According to DGBAS (1988), help and care to the disabled elderly in Taiwan area are as follows: Among those who live alone, 60.74% were taken care of by relatives or friends, 22.12% stay in hospitals on a long term basis, 11.86% had nobody to take care of, and 5.28% were cared for by family members. Among those
who live with spouse, 81.69% were taken care by family members, 6.42% stay in hospitals, 4.35% by relatives and friends, 2% in medical treatment center, 5% by unknown others. Among those live with children, 95.19% were taken care of by family members, 2.45% stay in hospitals, 1.26% by hired persons at home, 0.63% by nobody and 0.47% by relatives. Among those who live with relatives or friends, 70% were taken care of by family members, 30% were taken care of by relatives (See Table 4).

These data cannot provide us with a clear picture of the sources of formal and informal care to the elderly in Taiwan. It indicates the important role of the family and of kin networks in the lives of frail old people in Taiwan. It also shows that some proportion of the disabled elderly stay in the hospital for long-term care because there are no available caregivers. This is especially true among those elderly who live alone and among those who live with spouse who are too old to care the disabled elderly.
Table 4. Frequencies of Help and Care to the Disabled Old in Taiwan

(DGBAS, 1988)

<table>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Living alone</td>
<td>100</td>
<td>5.28</td>
<td>22.12</td>
<td>---</td>
<td>60.74</td>
<td>---</td>
<td>11.86</td>
<td>---</td>
</tr>
<tr>
<td>With spouse</td>
<td>100</td>
<td>81.69</td>
<td>6.42</td>
<td>2.0</td>
<td>4.35</td>
<td>---</td>
<td>5.54</td>
<td>---</td>
</tr>
<tr>
<td>With children</td>
<td>100</td>
<td>95.19</td>
<td>2.45</td>
<td>---</td>
<td>0.47</td>
<td>1.26</td>
<td>0.63</td>
<td>---</td>
</tr>
<tr>
<td>With rel. fri.</td>
<td>100</td>
<td>70.0</td>
<td>---</td>
<td>---</td>
<td>30.0</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

Family indicates the lineal kinship
Relative indicates kinship other than the lineal kinship

DGBAS survey (1990) provides the evidence of demand for more options of long-term care alternatives (Table 5). It indicates that 88.25% of the disabled elderly stay home for care in 1989, which is 4.25% less than 1988. Percentage of the dependent elderly in convalescent center increased from 6.7% in 1988 to 11.75% in 1989, which is a 5.05% increase in one year.
It further indicates the demand for institutional care and the increasing inability of the family to care for the dependent elderly. If more nursing home service is provided, the percentage probably will change more dramatically. It also indicates that an increasing proportion of elderly overstayed in general hospital due to the lack of long-term care resources. This results in waste and inappropriate use of hospital care resources. The table also shows the trend of a growing demand for formal care of service delivery. It also shows the broader scope of need for a planning and programming to adequately serve present and future
long-term care needs of the dependent elderly. In fact, since the majority of chronically disabled elderly are now living at home or with families rather than residing in institutions, there is an enormous demand for home care. In order to keep the family care as an important part of the long-term care continuum and to avoid as well as to delay unnecessary institutionalization, we need to strengthen and to provide support for family care by reducing or alleviating the burden the family has for caring for the dependent elderly.

D. Long-term care system in Taiwan

Several contextual (environmental) factors affect the use of long-term care service (Newman, et al. 1990; Wan, 1986). These factors include:
1). the nature and type of long-term care policies developed in the community,
2). the supply of nursing home beds or chronic hospital beds,
3). the restrictiveness of health insurance reimbursement,
4). the availability of community-based services, and
5). the structure of the coordinated long-term care system.

A rather unique and fragmented system exists currently in Taiwan, including a strong tradition of family-based old age support, veterans administration system, an emerging private sector which encompasses nursing home and home service, and public sector which includes nursing home, local primary health station, and home chore services.

It is assumed that most of the Chinese elderly have no special long-term care problem as long as they have families. If the traditional view of the family and the role of old people in the family reflected in the legislation and operating programs conflict with the actual circumstances of the elderly, it will create problems for old people, their family members, and for those who assume responsibility for the care of older Chinese.

Veterans in Taiwan constitute a relatively large and special part of the elderly population. According to the statistics of Vocational Assistance Commission of Retired Servicemen (VACRS), veterans beyond 65 years old comprised 227,000 people by 1989. Most of them
came from Mainland China. Many of them are unmarried and cannot live independently because of physical or mental handicaps (Chiou, 1990). The available data shows that the number of veterans with chronic illness in 1980 was about 32,400. The study of long-term care of veterans in Taiwan is obviously necessary.

Veterans administration system includes eleven veterans' chronic hospitals and ten Veteran's Homes in Taiwan, which provide long-term care for chronically disabled veterans.

There is only one public nursing home which takes care of the dependent elderly who have no families to support them. Home care services have been provided to low-income household with dependent elderly under the home care program of Bureau of Social Welfare, Taipei city government since 1991. Nurses from the local primary health station provide simple home nursing care periodically to the needy family. The service of this program is very limited due to the lack of personnel and budget.

Home care service, which provides health or skilled nursing care by professionals is facilitated by a authority of the Health Department since 1987. There
are 10 hospital-based and 3 non hospital-based programs (APH, 1990). However, at present only Government Employment Insurance experimentally covers home care service.

While the government is slow to acknowledge the need for long-term care of the functionally impaired elderly, the private sector is not. Many private for-profit nursing homes were established in recent years. The exact number of this kind of nursing home is unknown due to the fact that no appropriate administration could be applied to registration.

However, according to the conservative estimate (China Times Weekly, 1987), at least 50 private nursing homes exist in casual apartment building in Taipei city and suburban area, with 6 to 20 bed-capacity of each.

Simple nursing care by minimally trained nurse aides, and home chore services are provided by private sector as well. However, the price is too high for the poor family to afford. The quality of service is questionable, as well, because of no adequate regulation and licensing in existence.

Long-term care problem of the dependent elderly has been sensitively noticed by the social workers
working in hospitals in recent years. They noted the increasing discharge problem and the overstay problem of the chronically ill elderly because of the lack of appropriate long-term care service regardless of whether or not they had families (SWD, 1986). The average length of stay in nationwide acute hospitals in Taiwan has not been documented. However, the survey of eight medical centers show that average length of stay is 10.30 days to 15.30 days (Bureau of Health, 1990). This length of stay is about 1.6 to 2.4 times of the U.S. (APH, 1990). For elderly age 65 and over, the average length of stay is 11.50 days to 19.60 days which is longer than the length of stay of total patients. Long hospitalization of Taiwanese elderly is the result of lack of community care and full hospitalization insurance coverage. The great shortage of nursing homes also encouraged a dependence on general hospitals for chronic and skilled care. This dependence was exacerbated by the lack of restrictions on the length of stay in hospitals under health insurance program. Families of hospitalized elderly could also avoid the stigma of leaving an elderly family member in a nursing home by placing the elderly
in a hospital. Free medical care for veterans and low-income households, low payments of hospital fees for veteran’s dependents are also the factors facilitating long hospitalization.

According to this researcher’s work experience in a hospital, the placement of the functionally impaired elderly is managed in the following ways:
1. The veterans: only those veterans who have no families are discharged to veterans nursing care system with no alternative. Those who have families are reluctant to go to the veteran’s nursing care system.
2. Some of the elderly patients are discharged to private nursing homes if they or their families can afford it.
3. Some elderly patients are discharged home with hired persons to take care of them.
4. If family caregivers are available, some elderly patients are taken care of by families.
5. If family caregivers are not available, and the family can’t afford nursing home care, then the patients are either forced to be discharged home without adequate care or remain in the hospital for
skilled nursing care, particularly those covered by the health insurance program.

Under such circumstances, family members take on the heavy burden of providing care in their own homes, either by resigning their jobs, or paying for hired person. In either case, this results in a loss of family income or an increase in family expenditure. However, if the tradition of caring for aged parents and relatives at home becomes less popular and less possible because of heavy burden in modern society, long-term care will become an even greater problem.

Surveys conducted within the last 5 years (Hwang, 1984; DGBAS, 1990; Shu, 1986) indicate that the elderly rank the establishment of long-term care center as the priority of the elderly welfare needs. The government put the focus of the long-term care on the institutional care as well. According to CEPD (1986), 100 nursing home with 200 capacity each will be established by government planning by the year of 2000. It is obvious that the institutional care is the other unavoidable trend of long-term care policy besides home health care (Chiou, 1990).
Many scholars (Hsiao, et al., 1983; Hwang & Chen, 1986; chiou, 1989) advocate family care as the policy orientation undergirding the importance of family in Chinese tradition. The government advocates three generation living together to retain the Chinese traditional family function of caring for the elderly in modern society. As described above, in fact at present, the dependent elderly are mostly cared for by the family. Therefore, it is important to understand the needs of the family for the future of long-term care policy. Home care service must be the central focus of long-term care, as well (Wang, 1983; Chen, 1974; Shieh, 1982). Otherwise, the majority of the disabled elderly who live with the families will not have their needs met.

Actually, very few studies have been done to understand the needs of this population and their families. Disabled elderly and their families remain unserved and at risk in long-term care because they are most vulnerable, most immobile, and isolated. Those caregivers as well are more burdened and perhaps too burdened to get to a source of help. Family care in Taiwan is viewed as taken for granted and not
considered as an important part of long-term care policy. Little attention has been directed to the issues of family dynamics or to alternative choices for the elderly and their families. If supportive services for informal caregivers are needed, it is largely unknown.

Long-term care planners and policy-makers must be sensitive to the potential for change among both the clients and providers of care and indeed may wish to stimulate change through deliberate policies. As a first step, it is necessary to determine and document the needs that exist in the population. This should help in obtaining resources to alleviate need and to set priorities when needs exceed resources. This is the process of need assessment. From micro level, the clinical appraisal of existing utilization of long-term care services is one method of estimating long-term care needs (Shieh, 1982).
CHAPTER II

THEORETICAL BASE

Theoretical Framework

The theoretical model presented by Andersen and Newman (1973) was originally used to explain health service utilization of physician, hospital and dental services by the aged. However, it has been extended to other types of utilization, including in-home services (Bass and Noelker, 1987), and has begun to dominate the study of service utilization by the aged.

In Andersen and Newman's model, the use of health services is defined as a function of the predisposing, enabling, and need characteristics of the individual.

The predisposing characteristics reflect the fact that some individuals have a greater propensity to use services than do other individuals. According to Anderson, these propensities can be predicted by various individual characteristics that occur prior to
the incidence of episodes of specific illness. These characteristics may be classified as either demographic (age, gender, marital status, and family size), social-structural (education, occupation, social class, and race), or health beliefs. Basically, the model asserts that individuals with different demographic characteristics have different patterns of using health services. Individuals with different social-structural characteristics have different patterns of health services utilization. These patterns will vary with the salience of health beliefs.

The enabling characteristics in the behavioral model reflect the fact that while the individual may be predisposed to use health services, he or she will not use these services unless able to do so. An individual's ability to use health services depends on his or her family resources, including income, health insurance, having a regular source of care, and community resources. If there are sufficient family and community resources to enable the individual to use health services, then the individual will be more likely to use those services.
Finally, individuals must perceive some need for using health services when the appropriate levels of predisposing and enabling characteristics exist. That is, need is the basic and direct stimulus for the use of health services.

The Andersen’s framework has been criticized for lacking sufficient scope and in need of conceptual expansion and refinement (Mechanic, 1979; Wolinsky, 1978) Bass and Noelker (1987) expanded the Andersen’s framework to include predisposing, enabling, and need factors of both the impaired elder and the family caregiver on the use of in-home service.

Bass and Noelker’s expansion of the conceptual framework to include primary caregiver is based on the assumption that the primary caregiver influences the elder’s use of services directly (as when the caregiver contacts service organizations or professionals to seek services on the elder’s behalf) and indirectly (as when the caregiver informally influences the elder’s perceptions of illness, need, or the structure of the service system).
Application of the Model to Taiwan

Andersen and Newman’s model will be used to predict long-term care alternatives -- use of informal care and formal care in Taiwan. The study over the determinants of use of informal and formal care is not new in gerontological literature in the United States. Nevertheless, it has not been explored in Taiwan. Since Taiwan has different cultural background factors in attitudes towards elderly care, the extent to which the model found in gerontological literature that could explain long-term care alternatives in Taiwan needs to be tested. The family and other social value systems concerning the care of the physically and psychologically impaired elderly affect the likelihood of institutionalization as well (Sherwood, 1975). The variable that pertains to the specific environmental and cultural situation needs to be considered and included in the model. In this study, the primary caregiver’s attitude toward the use of formal care addresses the issue of cultural factors. This includes beliefs concerning who is to be responsible for providing the care, the perceived function of long-term care, etc. The adding of this variable also fits the
Anderson's model which includes health belief as one of the predisposing factor. The predisposing factors include the elder's age, gender, marital status, relationship with the primary caregiver, generation configuration, living arrangement, and health insurance/benefit. Primary caregiver's predisposing factor focus on his/her attitude toward the use of formal care for the disabled elderly parents.

In general, demographic variables tend to influence service use through their associations with need and have not been directly predictive of service use (Coulton & Frost, 1982; Wan & Arling, 1983; Wolinsky, et al, 1983).

Enabling characteristics of elder and caregiver refer to resources which promote or inhibit service use, which include household income, secondary caregivers, elder's ownership of house and primary caregiver's education. These characteristics for the elderly and the caregiver are identical, particularly when they share a household, which means household income and the assistance provided by secondary sources of informal support are the same. Another unique enabling factor is the caregiver's educational level,
which is used as indicator of potential knowledge of the service delivery system.

Need factors are viewed as a combination of actual impairment of elderly, and primary caregiver’s burden.

Theoretical model for long-term care utilization of this study in Taiwan is shown as Table 6.

Table 6. Model for Long-term Care Utilization

<table>
<thead>
<tr>
<th>Predisposing</th>
<th>Enabling</th>
<th>Need</th>
<th>LTC Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>elder</td>
<td>household income</td>
<td>ADL</td>
<td></td>
</tr>
<tr>
<td>age</td>
<td>gender</td>
<td>secondary caregivers</td>
<td></td>
</tr>
<tr>
<td>marital status</td>
<td>ownership of house</td>
<td>informal care</td>
<td></td>
</tr>
<tr>
<td>generation co.</td>
<td>rel. with caregiver</td>
<td>formal care</td>
<td></td>
</tr>
<tr>
<td>health insur/benefit</td>
<td>attitude toward use</td>
<td>burden</td>
<td></td>
</tr>
<tr>
<td>caregiver</td>
<td>education</td>
<td>of formal care</td>
<td></td>
</tr>
</tbody>
</table>
Literature Review

Long-term care is defined as "a set of health, personal care and social services delivered over a sustained period of time to persons who have lost or never acquired some degree of functional capacity" (Kane & Kane, 1987). The Commission on chronic illness (1975) defines a long-term care patient as "all persons disabled more than three months", including both persons in the community as well as those in institutions.

A literature search in Taiwan revealed that few studies have been done on the determinants of long-term care alternatives. Therefore, the gerontological literature on this topic in the United States is carefully selected since it matches the situation in Taiwan. Findings of other related studies about stroke patients and its impact on the family and caregivers' burden in Taiwan will be provided and combined.

Gerontological research on the determinants of institutionalization reveals that among the chronically ill, chances of staying functionally independent at home without being placed in a nursing home are

Kane & Kane (1987) listed commonality of risk factors for entering a nursing home among twelve studies as Table 7 shows.

Characteristics that appear to have the greatest commonality are age, diagnostic condition, ADL (activities of daily living), living alone, marital status, mental status, race and lack of social support. Three of the risk factors, living alone, marriage, and social supports, are to some extent, measuring the same reality.
Table 7. Commonality of Risk Factors for Entering A Nursing Home Among 12 Studies. (Kane & Kane, 1987)

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Number of Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12</td>
</tr>
<tr>
<td>Gender</td>
<td>xxx</td>
</tr>
<tr>
<td>Diagnostic Condition</td>
<td>xxx</td>
</tr>
<tr>
<td>Living Alone</td>
<td>xxx</td>
</tr>
<tr>
<td>ADL Problem</td>
<td>xxx</td>
</tr>
<tr>
<td>Marital Status</td>
<td>xxx</td>
</tr>
<tr>
<td>Mental Status</td>
<td>xxx</td>
</tr>
<tr>
<td>Race</td>
<td>xxx</td>
</tr>
<tr>
<td>Social Support</td>
<td>xxx</td>
</tr>
<tr>
<td>Poverty</td>
<td>xxx</td>
</tr>
<tr>
<td>Outpatient Admission</td>
<td>xxx</td>
</tr>
<tr>
<td>Hospital Admission</td>
<td>xxx</td>
</tr>
<tr>
<td>Bed Disability</td>
<td>xxx</td>
</tr>
</tbody>
</table>

**** Studies in which risk factor is examined
xx x Studies in which risk factor is found to be significant
Age

It is generally recognized that the risk of being institutionalized increases with age. Compared to the non-institutionalized elderly, the institutionalized elderly were more likely to be older (Townsend, 1965). Advancing age is found significantly related to institutionalization (Branch & Jette, 1982; Roy & Ford, 1990; Hanley, et al.; 1990). Age also has been associated with increased use of both formal and informal care (Cantor & Little, 1985).

Shieh (1982) in the study of estimating home health care needs of aged in Taipei city indicates that age makes significant difference in the elder’s physical, psychological and social function, which influences the need of home health care of the elderly.

ADL

ADL is an assessment of an individual’s capacity to perform routine activities of daily living that enable one to maintain oneself physically as well as to adapt to one’s environment. The most significant
predictor of level of formally provided service is seen to be level of ADL impairment. Most studies found that the severely functionally disabled elderly are heavily represented in the nursing home population (Branch & Jette, 1982; Greenberg & Ginn, 1979; Greene, 1983; Cohen, 1986; Weissert & Scanlon, 1983).

Among the ADL, depending in toileting or feeding appears to be an especially important predictor of nursing home care (Weissert & Scanlon, 1983). However, even among people with quite severe functional disabilities, a majority live in the community rather than in nursing homes (Rivlin, et al. 1988).

In Taiwan, the relationship between elderly’s level of dependence and the use of long-term care service is not explored yet. It is only known that stroke patient’s level of dependence is associated with the caregiver’s burden (Chiou, 1988; Lieu, 1991), and does have an impact on family function (Dai, 1990).

**Gender**

In the United States, women constitute some 75% of the residents of nursing homes because they outlive
those who might have cared for them in their old age. However, Hanley (1990) found that gender was not a significant predictor for institutionalization when controlling for other variables, even though women constitute the vast majority of nursing home residents.

In general, women in Taiwan outlive men by five years, consequently the aged are predominantly female. However, according to Chang, et al (1983) males in Taiwan constitute the majority of institutionalized elderly due to the historical background that many single soldiers retreated from mainland China to Taiwan in 1949. When getting old, many of them stay in Veteran’s Home or Public Elderly’s Home now. In addition, given the fact that more elderly women (72.09 %) live with children than the elderly man (59.98 %) in Taiwan (DGBAS, 1990), it is assumed that impaired elderly women would more likely be cared for by the family members than to be institutionalized.

**Income and Financial Asset Wealth**

DGBAS (1990) indicates that 58.37% of the major source of the elderly’s living expenses comes from
children, 15.29% from the elder’s or spouse’s saving, 11.87% from retirement pension, and 8.23% from earnings. The rest comes from relative’s or friend’s subsidy, social assistance, rent and interest revenue, stock and estate income etc. Thus the income of the elderly must be based on the estimate of total household income.

Coughlin, et al. (1989), Garber & McCurdy (1989), Newman, et al. (1990) found that home ownership was associated significantly with lower nursing home use. Bass & Noelker (1987) found household income have a significant influence on the use of in-home nursing and aide services. Hanley (1990) found that income and asset are insignificant predictors of institutionalization.

The role of income and home ownership in predicting long-term care use in Taiwan is obviously important under the current long-term care system. Given that elderly are charged higher rates for private institutional care, they or their families may have higher than average income. In Taiwan, home ownership might represent the traditional power of elderly in the family. In addition, home owners may be more reluctant
to enter institutional care because of the elderly’s traditional attachment to their homes. Thus, home ownership may be associated with the use of long-term care. It would also be associated with a lower use of nursing home care and homeowners would more likely purchase home care.

Elder’s Health Insurance & Benefits

Since health insurance is an important element of elder’s welfare, the type of health insurance and/or benefits an elder has will be treated as a variable and the relationship with the use of long-term care service will be examined.

DGBAS (1990) indicates that among the elderly in Taiwan area, 54.49% are insured and 45.5% are uninsured. Among the insured elderly, 26.44% have farmer insurance, 11.32% have the benefit of special treatment to veteran and veteran’s dependant, 10.77% have official insurance and the attached insurance, 3.07% have labor insurance, 1.26% have the benefit of special treatment to soldiers, 1.09% have private
medical insurance included in life insurance, and 1.02% have other kinds of health insurance or benefits.

Lieu (1991) found that whether the patient was insured significantly affects the quality of life of the caregivers. Shieh (1982) also indicates that being insured or uninsured makes a difference in the elderly’s physical, psychological and social function and influences home health care needs of the elderly. These two researchers, though not directly, show the relationship with the use of long-term care. They do indicate the effect of the elder’s health insurance type on the caregiver, the elder’s health condition and his/her home care needs.

Informal Support

The structure of one's social network and the presence or absence of social support from that network can influence the utilization of formal care services. Levels of formal care are responsive to differences in levels of informal support (Greene, 1983). In general, people whose social networks do not include an informal caregiver, such as a spouse or an adult daughter, face and increased risk of admission to a nursing home (Cohen, 1986; Vicente, 1979; Palmore, 1976; Weissert & Scanlon, 1983). Spouse caregivers are less likely to turn to other sources of help unless ill health threatens them (Hess & Soldo, 1985), but adult child caregivers more often face competing role responsibilities that can contribute to the decision to seek formal help (Horowitz, 1985). Recent multivariate studies on social supports, however, have suggested that the presence of informal support did not have a significant effect on nursing home admission (Newman et al, 1990; Coughlin, et al. 1989).

Some studies suggest people who lack living children to provide informal care were also at high risk of institutionalization (Greenberg & Ginn, 1979; Palmore, 1976; Wan & Weissert, 1981).
Living arrangements and living with one's family in particular are pointed to as critical determinants in predicting placement of the chronically disabled elderly (Branch & Jette, 1982; Vicente et al, 1979; Palmore, 1976; Roy & Ford, 1990).

The government advocates the three-generation household to support traditional Chinese filiality and family function of mutual care between young and old generation. Dai (1990), however, failed to show significant relationship between generation configuration and its impact on family function. Notwithstanding, he indicates that further study on the relationship of family configuration and long-term care is needed. Besides, recently "the three-generation household and family care" is clearly stated as the policy for elderly welfare (Bureau of Social Affairs, Taipei City Government, 1991). Therefore, the concept of family configuration will be included in the theoretical framework to test if this variable is really related to the long-term care alternatives.

In a study of the impact of stroke on Chinese families, Dai (1990) reveals that 78.3% of the patients have one to three family caregivers and that an average
of 1.7 family members participate in the direct care of stroke elderly. Chinese family develop their own ways to solve the problem of family care, such as children take turns to care, or share the care fee paid to the primary family caregiver. Nearly forty-seven percent of the patients were taken care of by the spouse. Seventy-one percent of the major caregivers are female -- spouse, eldest daughter-in-law and daughter.

Bass and Noelker (1987) indicates that secondary members of the informal care network must be included in the application of the Andersen model to chronically impaired elderly. These secondary caregivers may directly assist the elder with personal or health care, or they may relieve the primary caregiver from certain caregiving responsibilities. Therefore, secondary sources of informal help have the potential to influence the need for or use of formal care.

**Caregiver burden**

Findings of Bass & Noelker’s study (1987) indicate that caregiver need characteristics account for
significant variation in whether or not services are used. Gerontological literature also assumes that caregivers burden prompts the use of formal services (Horowitz, 1985; Stephens & Christianson, 1986). Miller & McFall’s (1991) study further indicates that predictors of formal service varied by level of personal burden, but not interpersonal burden. And use of formal help was greater in situations combining high levels of elder person’s needs, high levels of caregiver’s personal burden, and less support from the informal network.

Chiou (1988) indicates that the primary caregiver prefers family care rather than institutional care for the stroke patient. However, it also indicates that the preference for institutional care is associated with the burden of caregivers. The more stressed the caregiver feels, the more favorable the institutional care becomes. Stroke patient’s level of dependence is also associated with the burden of caregivers. Nevertheless, in Taiwan, the relationship between patient’s level of dependence, family caregiver’s burden, the preference for institutional care, and the
actual placement of stroke patients in institutional care is unknown yet.

Chiou's study reveals that primary caregiver's burden is not associated with the caregiver's sex, education, role (spouse or nonspouse), age and socio-economic level, and generation configuration. Whether the discrepancy between the findings of Chiou's study and those of other gerontological studies is due to the effect of culture or other unknown factors, it still needs further study.

Yeh (1990) in her study of caregiver's burden of chronically elderly in Taiwan indicates that identification of caregiver's burden can possibly reduce the risk of institutionalization associated with the high amounts of caregiver burden. Yeh also found that the average burden score reported by the caregivers in Taiwan was significantly lower than the score obtained by Lund & Caserta (1987) in the United States. What does this finding mean? Does the Chinese's attitude toward elderly influence his/her feeling of burden, which in turn affects the use of service? The answer to these questions need further study.
Caregiver's educational level

Yeh (1990) in her study in Taipei city found a lower educational level of the caregivers. She also found that caregivers utilized the family for assistance more often than community resources (formal care?), although 80.5% of the caregivers had received at least one community health nursing home visit. However, the relationship between caregiver's educational level and the use of service was not analyzed.

Attitude toward the use of formal care for the elderly

Results of the study conducted by Bureau of Social Affairs (BSA), Interior Ministry (1987) indicates that only 21.2% of the family caregivers have considered institutionalizing bedridden elderly at the beginning of long-term care. However, at the time of survey, it increased to 43.3% of the caregivers who are willing to institutionalize the bedridden elderly. It explicitly demonstrates that the willingness of family care to the bedridden elderly is facing great challenge.
There is an old Chinese proverb "there is no filial children for the chronically ill parent". What is the actual value of modern Chinese toward family filial piety related to bedridden elderly? What do those think who have the responsibility for taking care of the chronically ill elderly? How does that attitude affect the alternative of long-term care? Attitudes toward the care of disabled elderly will be treated as a variable and the relationship between the attitude and long-term care alternative will be examined in this proposal.

Dai (1990) noted that family of institutionalized elderly refused to be interviewed. Some of the families feel the intense conflict about whether they should send their stroke patient to the nursing home. It seems obvious that traditional Chinese value of filial piety and attitude toward use of formal care has an impact on the decision of choice of long-term care.

Research Interest

The surge of interest in long-term care has two main explanations. One is the recognition of the
important role of the family and of kin networks in the life of old people in industrialized countries (Shanas & Susman, 1981). The second is that with the increase in the number of old people and the rise in their longevity, legislators and administrators of the providing systems are confronted with the mounting maintenance and service costs in the care of frail and sick old people. Decision makers, torn between humanitarian and budgetary concerns, have turned to the family as a resource in the care of the elderly.

A major international trend of public policy on long-term care has focused on ways to minimize the use of nursing homes and other long-term care facilities and to rely increasingly on less expensive home-care services to help elderly persons remain in the community if feasible (Monk, 1991).

From the aforementioned description of long-term care background in Taiwan, the need for long-term care have grown rapidly because of the increase in the number of old people, their life expectancy, and their level of chronic disability. On the other hand, however, with women entering labor market at an increasing rate, the elderly who live with families
decrease. It can be expected that the availability of family caregiver will diminish gradually and the need for institutional care will increase. The rapid growth of private nursing home, even under no quality control, and long hospital stay clearly demonstrate the strong need for institutional care. Department of Health is ready to provide alternative health service to meet the medical needs of disabled elderly. Government social policy also clearly states that family care will be the focus of long-term care (BSA, 1987). Home care programs supported by the government for low-income household with dependent elderly have started in 1991 as well.

Although the demand and need for long-term care options are growing, there is little empirical evidence to guide policy makers in Taiwan. From the literature review of Taiwan, only Chiou’s (1988) study indicates the relationship between primary caregiver’s burden of stroke patients and their preference for long-term care options. Yeh (1990) points out the importance of the test of the conceptual framework for caregiver’s alternate decision regarding the location of chronically ill elderly.
At this critical point, it is vital to understand why some people choose institution care while the others choose home care. What are the factors influencing people's choice of long-term care options? Some elderly persons are admitted to nursing homes because of need resulting from chronic disease and functional limitation. However, there are still many elderly persons residing outside of institutions who have limitations that are so severe as to make them bedridden. This raises the question: Why are some elderly able to be maintained outside of institution even with severe disabilities, while others must seek care in institutions? Is this because those in institutions have greater need for more skilled care, or are there other factors that influence the use of institutional care? What are the family caregiver's satisfaction level with various long-term care options?

This study will provide characteristics of people who have chosen various options, and will lead to some indicators useful in planning future service system. Policy makers need these important indicators to develop informed policy in this important health and welfare service area. Before resource allocation
decisions can be made, more and better data are needed on which to base the provision of long-term care services for the aged. Answers to the following research questions can help build the models to predict future needs for long-term care service and to identify the needy population for different long-term care alternatives. Thus more efficient use of resources can be achieved, and the capacity of formal care to support dependent elderly can be forecasted. It can also help clinical social workers further understand the factors and dynamics of families’ choice on long-term care alternatives.

Research Questions

Q1. What are the characteristics of elderly stroke patients who use formal care?

Q2. What are the characteristics of elderly stroke patients who use informal care?

Q3. What are the characteristics of caregivers of elderly stroke patients who use formal care?

Q4. What are the characteristics of caregivers of elderly stroke patients who use informal care?
Q5. Is the caregiver's level of satisfaction related to their use of care?
CHAPTER III

METHODOLOGY

Hypothesis

Question 1. What are the characteristics of elderly stroke patients who use formal care?

H1: Older elderly are more likely to use formal care than young elderly.

This hypothesis is a replication of findings in U.S. studies which linked advanced age with institutionalization (Branch & Jette, 1982; Roy & Ford, 1990; Hanley, et al. 1990). Shieh’s work in Taiwan (1982) argued that age affects physical, psychological and social functioning and, therefore, influenced home care (formal) service use.

H2: Male elderly are more likely to use formal care than female elderly.

53
This hypothesis reflects the special historical background of Taiwan in which males constitute the majority of institutionalized elderly (Chang, 1983). In addition, elderly women are more likely to live with children than elderly men in Taiwan (DGBAS, 1990). Thus, it is hypothesized that males tend to use more formal care.

H3: Insured elderly are more likely to use formal care than uninsured elderly.

Shieh’s (1982) study in Taiwan indicated that being insured or uninsured made a difference in the elderly’s physical, psychological and social functioning. Insurance status also influenced home health (formal) care needs. In addition, Government Employee Insurance covers the payment of home health care and veterans and their dependents have the benefit of special treatment for long-term care in a veteran’s hospital. Taipei City Government has begun to give financial assistance for home care service for low-income households with dependent elderly. Therefore, insurance covered elderly are more likely to use formal care.
H4: Elders of higher-income households are more likely to use formal care than elders of low-income. In Taiwan, most formal care services are provided by the private sector. Elder people who use formal care service have to pay the expenses out of pocket. It is, consequently, hypothesized that elders with higher household income will use more formal care.

H5: Elders with higher levels of ADL are more likely to use formal care.

This hypothesis is a replication of findings in U.S. studies which link ADL with formal care (Branch & Jette, 1982; Greenberg & Ginn, 1979; Greene, 1983; Cohen, 1986; Weissett & Scanlon, 1983). Chiou's (1988) and Lieu's (1991) studies in Taiwan found ADL is associated with the caregiver's burden. Because studies support burden being associated with the use of formal care (See hypothesis 12), therefore, ADL, is associated with the use of formal care.

Question 2. What are the characteristics of elderly stroke patients who use informal care?
H6: Married elders are more likely to use informal care.

This hypothesis is a replication of findings in U.S. studies which link marital status with institutionalization (Palmore, 1976; Vicente, 1979; Weisssert & Scanlon, 1983; Cohen, 1986).

H7: Elders of three-generation households are more likely to use informal care.

There is no prior study to support this hypothesis. However, since three-generation household may have more available caregivers, it is hypothesized that three-generation households will use more informal care.

H8: Elderly with spousal caregivers are more likely to use informal care.

This hypothesis is a replication of findings in U.S. studies which indicate the relationship between spouse caregivers and nursing home admissions (Cohen, 1986; Vicente, 1979; Palmore, 1976; Weisssert & Scanlon, 1983).
H9: Elders who own their homes are more likely to use informal care.

This hypothesis is a replication of findings in U.S. studies which indicate that home ownership was significantly associated with nursing home use (Coughlin, et al., 1989., Garber & McGurdy, 1989., Newman, et al., 1990)

H10: Elders with more secondary caregivers are more likely to use informal care.

The number of secondary caregivers didn’t have a significant effect on the use of in-home care service in Bass & Noelker’s (1987) study. However, Dai’s (1990) study in Taiwan showed that the average number of informal caregivers in Taiwan is 1.7, which is higher than the number of 1.07 in Bass & Noelker’s (1987) study. Since more secondary caregivers may help with an elder’s home care and relieve the primary caregiver’s burden, it is hypothesized that elders with more secondary caregivers will use more informal care.
Question 3: What are the characteristics of caregivers of elderly stroke patients who use formal care?

H11: Caregivers with higher education are more likely to use formal care.

There is no prior empirical support for this hypothesis. However, a caregiver’s educational level may indicate his or her knowledge about the needs of the elder, the service delivery system and the benefit formal care service may provide. It is hypothesized that caregivers with a higher educational level will use more formal care.

H12: Caregivers with higher level of caregiver’s burden are more likely to use formal care.

This hypothesis is a replication of findings in U.S. studies which linked high burden and use of formal care (Horowitz, 1985; Stephens & Christianson, 1986; Bass & Noelker, 1987; Miller & McFall, 1991). Chiou’s (1988) study in Taiwan indicated that the preference for institutional care is associated with the burden of caregivers of stroke elders.
Question 4: What are the characteristics of caregivers of elderly stroke patients who use informal care?

H13: Caregivers with higher level of traditional attitudes toward use of formal care are more likely to use informal care.

There is no prior study to support this hypothesis. However, there are studies indicating that people's attitude influence their subsequent behavior. Thus, in Taiwan, Chinese's attitude toward the use of formal care may affect actual behavior in using formal care.

Question 5: Is caregiver's level of satisfaction related to their use of care?

H14: Caregiver's satisfaction is related to the use of care.

Because the use of formal care may relieve the caregiver's burden and increase the elder's well-being, the association between satisfaction and use of formal care is hypothesized.
Conceptual and Operational Definitions

According to the model by Bass and Noelker (1987), predictors of the use of long-term care can be conceptualized as having predisposing, enabling and need characteristics of both the elder and his or her primary caregiver. These three categories of predictors as used in this study are defined below.

Predisposing characteristics:

age: Age is conceptually and operationally defined as the actual years of age of elderly.

gender: Gender is the sex of elderly, which includes female and male. Gender is assigned the following codes. (1=female, 0=male).

generation configuration: Generation configuration is conceptually defined as the number of generations living together, which includes one-generation household, two-generation household and three-generation household. This variable is assigned the following codes. (0=one-generation household, two-generation household, 1=three-generation household).
marital status: Marital status is defined as the elderly’s marital status at the time of elderly stroke patient’s discharge from hospital. This variable is assigned the following codes. (1=married, including married, widowed, divorced, 0=unmarried, including single).

relationship with caregiver: Relationship with caregiver is defined as the blood or marital relationship of the elderly with the primary caregivers. This variable is conceptualized as spousal and non-spousal caregiver and coded as follows. (1=spouse, 0=non-spouse, including daughter-in-law, daughter, son, unpaid friends, relatives, and neighbors).

health insurance/benefit: Health insurance/benefit is defined as the coverage of elderly by a health insurance program, medicaid or special treatment. This variable is divided as insured and uninsured and coded as follows. (1=insured, including farmer insurance, official insurance and attached insurance, special treatment to veterans, military insurance, labor insurance, Medicaid, private insurance, etc, 0=uninsured).
caregiver's attitude toward use of formal care:

Caragiver's attitude toward use of formal care is conceptually defined as the degree of caregiver's agreement on who's responsibility to care for the disabled elderly, their perspectives on traditional Chinese filiality, and social reactions for the formal care. Six items were created to measure the caregiver's attitude toward use of formal care for the disabled elderly. Higher scores indicate a more traditional attitude toward formal care. Item 6 are reverse scored. Internal reliability (Cronbach's alpha) of this attitude scale is .82 for this sample.

Enabling characteristics:

Household income: Household income is defined as per capita monthly income, including overtime pay, bonuses and commissions, income from rent, interest, dividend. The coding scheme includes eight categories coded from 1= less than NT$ (New Taiwan dollars) 3,000 to 8= over NT$ 33,000.
Ownership of house: Ownership of house is defined by the elder’s name on the house title. The variable is coded as follows (1=owner, 0=non-owner).

Secondary caregivers: Secondary caregivers is defined as number of persons providing at least one ADL task to assist the elder.

Education: Education is defined as caregiver’s actual level of education. The coding scheme includes four levels coded from 1= 0 to 12 years to 4= graduate school.

Need characteristics include:

Functional disability: Functional disability is measured through six ADL items: feeding, dressing, toileting, getting in and out of bed, bathing, and continence (see Katz, et al. 1970). Caregivers will be asked to assess whether a task can be accomplished by the patient with or without help from others. The coding scheme for this variable is: 0= no help is required to do the task; 1= some help is required to do the task; 2= the task can not be done at all without any help from others. Higher scores indicate higher levels of disability and dependence. Internal
reliability (Cronbach’s alpha) of ADL scale in this study is .94.

**Caregiver’s burden** Caregiver’s burden will be measured by the Personal Burden Scale (Miller, McFall & Montgomery, 1991), which represents the confinement associated with limitations in personal actions and activities as a result of providing care. This scale has six observable indicators: worsening health; cost of care is too expensive to afford; need to provide care when not feeling well; emotional strains; limitations on social activities; and elder needs constant attention. Internal reliability (Cronbach’s alpha) for the Personal Burden Scale is .76 (Miller & McFall, 1991). In this study, the reliability for the measurement of burden is .89.

**Caregiver’s satisfaction:** This is a one item, dichotomous question which determines whether a caregiver is satisfied with the care the elder received. It is used as a probe for an open-ended question to learn more about the ideas caregivers have about satisfactory and unsatisfactory care of the elderly. The coding scheme for this variable is yes=1, no=0.
Measurement of long-term care utilization

The dependent variable in this study is the use of long-term care, which is divided into two categories: informal and formal care.

Informal care Informal care is defined as the assistance provided by family, friends and unpaid relatives and neighbors (Stephens & Christianson, 1986). This variable is coded 0.

Formal care Formal care is defined as the care that provided by organized service agencies whether publicly subsidized or private, and hired help (Stoller & Earl, 1983; Greene, 1983). Formal care in this study includes: 1) Institutionalization in private nursing home, public or private elder home, veterans' home, veterans' hospital and other chronic hospital, 2) Paid helper, which encompass home health care, home maker services etc. This variable is coded 1.
Research Design and Data Collection

Surveys are used to determine what people do, what they plan to do, their knowledge, opinions, attitudes, and value systems. A survey research design was used for data collection. The questionnaire (Appendix A) was developed in English and translated into Chinese for administering to Taiwanese people. The survey was conducted by phone interview. Interviewing by phone was chosen because of the limitation of researcher’s time in Taiwan and a restricted budget.

According to Wu (1984), telecommunication is highly developed in Taiwan. According to the statistics of North Taiwan Telecommunication Administration, there were about 50 subscribers per hundred persons in north Taiwan area by June 1991 (NTTA, 1991). However, the exact number of the population over 65 who have phones in Taiwan is unknown. Still, the use of phone survey was judged not to affect the representativeness of the sample. In addition, a phone survey has the advantage of easy access to subjects, and the completion rate for phone surveys is higher than for home visit surveys (Dillman, 1978).
The respondent will be the primary caregiver. Primary caregiver is defined as a helper who is at least 15 years of age and provides at least one activity of daily living (ADL) assistance.

The sampling frame is built from Stroke Patients Registry in Taiwan Area from April, 1989 to Nov, 1991. The Association of Neurology, ROC provided the researcher access to the Registry.

**Sampling criteria:**

Cases were selected for inclusion into the study using all of the following criteria.

1. Age 65 and over;
2. Residence in Taipei metropolitan area. This geographic restriction controls for differences in the supply of nursing home beds and home care service in different areas of Taiwan;
3. Three months post discharge. The purpose of this criteria is to control for chronicity; and
4. Moderate to severe dysfunction as a result of the stroke. The selection of this criteria is justified by the fact that if the patient is only slightly affected
by the stroke, he/she will not need much care, formal or informal.

**Sample size**

The number of stroke patients who met all four sampling criteria was 460. Deciding an appropriate sample size is complicated. Monette, et al. (1990) indicates that four factors influence the sample size for simple random samples: 1) the research hypotheses, 2) the precision, 3) the homogeneity of the population, 4) the sampling fraction.

According to Agresti & Finlay (1986), in estimating a proportion, the sample size required is expressed in the algorithm where \( p \) = parameter representing the proportion of the defined population classified in the specific category, \( Z \) = confidence limits, \( B \) = sampling error.

\[
    n = p(1-p)(Z_{a/2}/B)^2
\]

Based on DGBAS survey (1990), the proportion of dependent elderly in Taiwan who use formal service after discharge from hospital is about 7 percent. In
most scientific research, 5 to 6 percent sampling error with 95 percent confidence limits is acceptable (Monette, 1990). In this study, when 4 percent sampling error with 95 percent confidence limits is chosen, the adequate sample size by using this formula would be

\[ n = (0.07)(0.93)(1.96/0.04)^2 = 126 \]

As a rule of thumb, the correction formula should be used if the sampling fraction is more than 5 percent. The correction formula is \( n' = n/(1+(n/N)) \). The sampling fraction in this study is 126/460=27%. Thus \( n' = 126/(1+.27) = 99 \). A sample size of 99 or more will be appropriate for this study.

The sample was selected from the sampling frame by a simple random sampling procedure. A sample of 103 was drawn. The survey was conducted from mid-January to early March in 1992.

Since people may fear the label of unfilial if they choose to institutionalize an elderly parent or family member, this study faced the threat of selection bias. It was anticipated that the response rate from family
care category might exceed that of institutionalization category, which would influence the representativeness of the sample. To reduce this threat, the assurance of confidentiality was guaranteed to the subjects.

The steps of sample selection are as follows (Table 8): 174 samples were selected by simple random sampling from 460 listed names that met four criteria and were used as the sampling frame. Telephone calls were made twice for each case during both the daytime and the evening. Of the 174, fifteen elderly (9%) were dropped from the sample because they died within three months after being discharged from hospital. Fifty-four (31%) subjects were eliminated because nobody could be reached by phone (termed non-approachable subjects). Two (1%) subjects refused to be interviewed. 103 (59%) subjects were interviewed by phone. The response rate of those subjects who were eligible and able to be reached (103 out of 105, that is 98%) can be seen as the result of support of public agencies and the respondents’ need to express their service needs.
Table 8. Steps of Sample Selection

460 subjects were in sampling frame (provided by Stroke Patients Registry of Taiwan Area. All of them met four criteria, according to the Registry).

simple random sample selected N = 174

15 (9%) died within three months after discharge
54 (31%) could not be reached by phone (non-approachable subjects)
2 (1%) refused to be interviewed
103 (59%) interviewed
Characteristics of Non-approachable Subjects

The characteristics of the fifty-four non-approachable subjects were analyzed to evaluate possible sample biases. The results are shown in Table 9. Approximately 48% of the non-approachable elderly were discharged from two major hospitals. Nearly 80% of them were discharged before Dec. 1990 and about 57% of them have phone numbers with 8 or 9-initialized area. One explanation for the failure to reach these elders is that their residence has changed because they were discharged more than one year ago; or the phone numbers of 8 or 9-initialized area have been changed.

Compared with the characteristics of the sample and the population (Table 8, 9, page 74, 76), the group of non-approachable elderly were younger, more male than female, more uninsured than insured, and had better ADL function. Approximately 59% fell into the slightly dependent category. While the threat of sample bias cannot be eliminated, it is diminished in this study because one could logically expect an older and more disabled group to be in need of and use both formal and informal services.
Table 9. Characteristics of Non-approachable Subjects

<table>
<thead>
<tr>
<th>characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSMGH</td>
<td>11</td>
<td>20.4%</td>
</tr>
<tr>
<td>MMH</td>
<td>15</td>
<td>27.8%</td>
</tr>
<tr>
<td>other 8 hosp.</td>
<td>28</td>
<td>51.8%</td>
</tr>
<tr>
<td>date of discharge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>before Dec, 1990</td>
<td>43</td>
<td>79.6%</td>
</tr>
<tr>
<td>after Dec, 1990</td>
<td>11</td>
<td>20.4%</td>
</tr>
<tr>
<td>tel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-area</td>
<td>15</td>
<td>27.8%</td>
</tr>
<tr>
<td>9-area</td>
<td>16</td>
<td>29.6%</td>
</tr>
<tr>
<td>other 5 areas</td>
<td>23</td>
<td>42.6%</td>
</tr>
<tr>
<td>age</td>
<td>mean</td>
<td>74.74</td>
</tr>
<tr>
<td>gender</td>
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<tr>
<td>female</td>
<td>19</td>
<td>35.2%</td>
</tr>
<tr>
<td>male</td>
<td>35</td>
<td>64.8%</td>
</tr>
<tr>
<td>insurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>insured</td>
<td>27</td>
<td>50.0%</td>
</tr>
<tr>
<td>uninsured</td>
<td>27</td>
<td>50.0%</td>
</tr>
<tr>
<td>ADL</td>
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<td></td>
</tr>
<tr>
<td>slightly dependent</td>
<td>32</td>
<td>59.3%</td>
</tr>
<tr>
<td>partially dependent</td>
<td>15</td>
<td>27.8%</td>
</tr>
<tr>
<td>dependent</td>
<td>7</td>
<td>13.0%</td>
</tr>
</tbody>
</table>
Decision-makers vs. Caregivers

In Taiwan, family members are the critical decision-makers concerning long-term care alternatives for disabled elderly. However, it is not clear who in the Chinese family is the decision-maker. Therefore, this study ascertained if the decision-maker was different from the primary caregiver by recording the decision-maker’s position in the family in the questionnaire.

Protection of Human Subjects
Obtaining Informed Consent

A cover letter (see Appendix A) was read to the subjects before the interview to acquire the subject’s consent of participation. No written consent form was required for those subjects who agreed to participate in the study because 1) if the interview is conducted by phone, written consent would not be available, 2) sign a written consent form is an unusual act for Chinese, which might cause the subjects wariness and influence their willingness to participate. Research has found that obtaining written consent form can reduce people’s willingness to participate in research.
(Monette, et al, 1990). This study was approved by the Case Western Reserve University Committee for the Protection of Human Subjects.

Only the researcher and interviewer know the names and phone numbers of the respondents. To safeguard the identity of the respondents and the linkage between specific information and specific respondents, each respondent was assigned a number after the data collection was complete.

**Description of Sample Characteristics**

The age of the elderly in the sample is predominantly between age 70 and 80 years old (59.2%) with a mean age of 76 years old. Approximately 46% of the sample is female. Almost 97% of the sample is married. Less than 3 percentage of the sample is single. Almost 55% of the elderly were insured. The description of sample characteristics is shown in Table 10.
### Table 10. Description of Sample Characteristics—Percentage, Mean and Standard Deviation

<table>
<thead>
<tr>
<th>variables</th>
<th>definition</th>
<th>%</th>
<th>mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>predisposing age</td>
<td></td>
<td>76</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>66-94</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65-70</td>
<td></td>
<td>20.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70-80</td>
<td></td>
<td>59.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>beyond 80</td>
<td></td>
<td>20.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>100.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gender</td>
<td></td>
<td>.46</td>
<td>.50</td>
<td></td>
</tr>
<tr>
<td>1 = female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>female</td>
<td></td>
<td>46.0</td>
<td></td>
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<tr>
<td>male</td>
<td></td>
<td>54.0</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>100.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>marital status</td>
<td></td>
<td>.97</td>
<td>.17</td>
<td></td>
</tr>
<tr>
<td>1 = married,widowed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>single</td>
<td></td>
<td>2.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>married</td>
<td></td>
<td>52.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>widowed</td>
<td></td>
<td>44.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>100.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>health insurance</td>
<td></td>
<td>.55</td>
<td>.50</td>
<td></td>
</tr>
<tr>
<td>1 = insured</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>farmer’s insurance</td>
<td></td>
<td>15.5</td>
<td></td>
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</tr>
<tr>
<td>government employee ins.</td>
<td></td>
<td>22.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>veteran’s spec treatment</td>
<td></td>
<td>11.7</td>
<td></td>
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</tr>
<tr>
<td>military insurance</td>
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<td>2.9</td>
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<td>labor insurance</td>
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<td>medicaid</td>
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<tr>
<td>private ins.</td>
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<td>1.0</td>
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<td></td>
</tr>
<tr>
<td>No insurance</td>
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<td>44.6</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>100.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Comparison of Population and Sample

Age, gender and health insurance/benefit of the sample were compared to the general population because data about these three characteristics of the population was available. Table 11 shows that mean age of the population is 75.2 years old and it is 76 years old of the sample. About 55% of the population are male and 54% of the sample were male. As to the health insurance/benefit, 57% of the population were insured and 55% of the sample were insured. This comparison shows that the distributions of population and of the sample on age, gender, and health insurance/benefit are quite similar.
<table>
<thead>
<tr>
<th></th>
<th>SAMPLE</th>
<th></th>
<th>POPULATION</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean</td>
<td>SD</td>
<td>mean</td>
<td>SD</td>
</tr>
<tr>
<td>age</td>
<td>76</td>
<td>6.3</td>
<td>75.2</td>
<td>6.1</td>
</tr>
<tr>
<td>gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>54%</td>
<td>48</td>
<td>46%</td>
</tr>
<tr>
<td>female</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>255</td>
<td>55.4%</td>
<td>205</td>
<td>44.6%</td>
</tr>
<tr>
<td>insurance status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>uninsured</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>46</td>
<td>45%</td>
<td>57</td>
<td>55%</td>
</tr>
<tr>
<td>insured</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>198</td>
<td>43%</td>
<td>262</td>
<td>57%</td>
</tr>
</tbody>
</table>
Mean and Standard Deviation of All Predictors

The description of age, sex, marital status and insurance status of the sample, which have already been reported, will not be repeated here. Table 12 shows that nearly 31% of the elderly have spousal caregivers. The percentage of three-generation household is 70%. The percentage of elderly who own their houses is 45%. The mean number of secondary caregivers is 1.75. The mean of household income is 3.73, which is about NT$ 13,000 - 17,999. Approximately 64% of the primary caregiver’s educational level is 0-12 years. More than 88% of the primary caregivers’ educational level is lower than high school. The mean score of ADL is 8.4. The mean score of burden is 3.4.


Table 12. Percentage, Mean and Standard Deviation of All Predictors

<table>
<thead>
<tr>
<th>variables</th>
<th>definition</th>
<th>%</th>
<th>mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>predisposing</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age</td>
<td>66-94</td>
<td>76</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>gender</td>
<td>1=female</td>
<td>.46</td>
<td>.50</td>
<td></td>
</tr>
<tr>
<td>marital status</td>
<td>1=married, widowed</td>
<td>.97</td>
<td>.17</td>
<td></td>
</tr>
<tr>
<td>health insurance</td>
<td>1=insured</td>
<td>.55</td>
<td>.50</td>
<td></td>
</tr>
<tr>
<td>caregiver relationship</td>
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</tr>
<tr>
<td></td>
<td>spouse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>31.1%</td>
<td></td>
<td>.47</td>
</tr>
<tr>
<td></td>
<td>nonspouse</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>68.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number of generation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1=three-generation household</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.70</td>
<td>.46</td>
<td></td>
</tr>
<tr>
<td></td>
<td>one-two-generation</td>
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<td></td>
<td></td>
<td>30.1%</td>
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<tr>
<td></td>
<td>three-generation</td>
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<tr>
<td></td>
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<td>69.9%</td>
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<td>attitude</td>
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<tr>
<td></td>
<td>10-25</td>
<td>18.40</td>
<td>2.96</td>
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<tr>
<td>enabling</td>
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</tr>
<tr>
<td>number of secondary caregivers</td>
<td>0-7</td>
<td>1.75</td>
<td>1.90</td>
<td></td>
</tr>
<tr>
<td>owner of house</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1=owner</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>.45</td>
<td>.50</td>
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</tr>
<tr>
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<td>owner</td>
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<tr>
<td></td>
<td></td>
<td>44.7%</td>
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<tr>
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<td>non-owner</td>
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<td></td>
<td></td>
<td>55.3%</td>
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<td></td>
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<tr>
<td></td>
<td>0-2,999</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>3,000-7,999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8,000-12,999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13,000-17,999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>18,000-22,999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>23,000-27,999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>28,000-32,999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>beyond 32,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.73</td>
<td>2.10</td>
<td></td>
</tr>
<tr>
<td>caregiver’s education</td>
<td>1-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0-12 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>high school</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>college/university</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>graduate school</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.5</td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td>need</td>
<td>ADL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0-12</td>
<td>8.4</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>caregiver’s burden</td>
<td>0-6</td>
<td>3.4</td>
<td>2.4</td>
<td></td>
</tr>
</tbody>
</table>
Description of Service Utilization of Samples

Thirty one percent of the sample used some form of formal care. Fifteen cases, 14.6% of the sample, had experienced institutional care only sometime after they were discharged. Twelve respondents (11.7%) of the sample used paid caregivers only. Five people (4.8%) had used both institutional care as well as paid care. Sixty nine percent of the sample used informal care. The description of service utilization of samples is shown in Table 13.

Table 13. Description of Service Utilization

<table>
<thead>
<tr>
<th>use of care</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>institutional care</td>
<td>15</td>
<td>14.6%</td>
</tr>
<tr>
<td>paid care</td>
<td>12</td>
<td>11.7%</td>
</tr>
<tr>
<td>institution &amp; paid</td>
<td>5</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>31.1%</td>
</tr>
<tr>
<td>Informal care</td>
<td>71</td>
<td>68.9%</td>
</tr>
<tr>
<td>Total</td>
<td>103</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
CHAPTER IV

DATA ANALYSIS AND FINDINGS

Data Analysis

The Statistical Package for the Social Sciences was used in the analysis of the 103 cases interviewed in Taiwan.

Information about the decision-maker for long-term care alternatives will be presented to provide a context for the discussion of the analysis to follow.

Bivariate analysis between each independent variable and dependent variable was conducted to determine if an association existed between each independent variable and the dependent variable. Chi-square tests were performed.

The relationship between use of care and satisfaction level was examined by chi-square test. The reasons for satisfaction level of care on open-ended question were categorized to learn the ideas the caregivers have about satisfactory care of the dependent elderly.

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Multivariate analysis was performed by logistic regression to determine a model for prediction of formal care use in Taiwan.

**Decision-makers for Long-term Care Alternatives**

Table 12 shows that 44% of the sample's use of care was decided by the son. Nearly 22% of the elderly had decided their own care. About 20% of the decision-makers were spouses and 9% were decided by the whole family. Only 5% were decided by the daughters. In this sample, the son in the family was the most frequent decision-maker in the decision for long-term care alternatives. Spouses and the elderly also played important roles in the decision for long-term care alternatives for this group of Taiwanese elderly.
Table 14. Decision-maker of the Stroke Elderly’s Long-term Care Alternatives

<table>
<thead>
<tr>
<th>decision maker</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>son</td>
<td>45</td>
<td>43.7%</td>
</tr>
<tr>
<td>elder</td>
<td>23</td>
<td>22.3%</td>
</tr>
<tr>
<td>spouse</td>
<td>21</td>
<td>20.4%</td>
</tr>
<tr>
<td>whole family</td>
<td>9</td>
<td>8.7%</td>
</tr>
<tr>
<td>daughter</td>
<td>5</td>
<td>4.9%</td>
</tr>
<tr>
<td>total</td>
<td>103</td>
<td>100</td>
</tr>
</tbody>
</table>

Bivariate Analysis

This study posed questions about the characteristics of dependent elderly and their family caregivers who use formal care and informal care. An initial interest was to learn if associations between independent variables and the use of care exist. The findings of chi-square test for these hypotheses are shown in tables (Table 15 to Table 27).
H1. Older elderly are more likely to use formal care than young elderly.

Table 15 shows that nearly 14 percent of the elderly aged 65 to 70, 38 percent of aged 71 to 80, 29 percent of aged 81 to 94 used formal care, while approximately 86 percent of the elderly aged 65 to 70, 62 percent of aged 71 to 80, 71 percent of aged 81 to 94 used informal care. The association between age and use of care is not statistically significant ($x^2 = 4.08$, df= 2, p > .05). The null hypothesis that age has no association with the use of care can’t be rejected.

Table 15. Influence of Age on Use of Care

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Informal</th>
<th>Formal</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 - 70</td>
<td>18 (85.7)</td>
<td>3 (14.3)</td>
</tr>
<tr>
<td>71 - 80</td>
<td>38 (62.3)</td>
<td>23 (37.7)</td>
</tr>
<tr>
<td>81 - 94</td>
<td>15 (71.4)</td>
<td>6 (28.6)</td>
</tr>
</tbody>
</table>

$x^2 = 4.08$  df=2  p > .05

H2. Male elderly are more likely to use formal care than female elderly.
Table 16 shows that nearly 64 percent elderly men used informal care, 36 percent elderly men used formal care, while 75 percent of elderly women used informal care, 25 percent of elderly women used formal care. Chi-square test indicates that gender and use of care is not significantly associated ($x^2 = 1.55$, df=1, $p > .05$). The null hypothesis that gender has no association with the use of care can't be rejected.

<table>
<thead>
<tr>
<th>Table 16. Influence of Gender on Use of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>informal</td>
</tr>
<tr>
<td>formal</td>
</tr>
<tr>
<td>$x^2 = 1.55$</td>
</tr>
</tbody>
</table>

H3: Insured elderly are more likely to use formal care than uninsured elderly.

Table 17 shows that about 72 percent of the uninsured elderly used informal care, and almost 28 percent of the uninsured elderly used formal care,
while nearly 67 percent of the insured elderly used informal care and almost 33 percent of the insured elderly used formal care. Chi-square test shows that association between health insurance and use of care is not significant \((x^2 = .31, df=1 \quad p>.05)\). The null hypothesis that health insurance has no association with the use of care can’t be rejected.

<table>
<thead>
<tr>
<th></th>
<th>uninsured</th>
<th>insured</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(N)</td>
<td>%</td>
</tr>
<tr>
<td>informal</td>
<td>33</td>
<td>71.7</td>
</tr>
<tr>
<td>formal</td>
<td>13</td>
<td>28.3</td>
</tr>
</tbody>
</table>

\(x^2 = .31\) \(df=1\) \(p>.05\)

H4: Elders of high-income households are more likely to use formal care than elders of low-income household.

Table 18 shows that approximately 77 percent of low-income elderly used informal care and 23 percent used formal care, while almost 46 percent of the high-
income elderly used informal care and nearly 54 percent
used formal care. Chi-square test shows that the
association between household income and use of care is
significant ($x^2 = 8.42$ df=1 $P<.01$). The null
hypothesis that household income has no association
with the use of care can be rejected.

<table>
<thead>
<tr>
<th>Table 18. Influence of Household Income on Use of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>low (0-17,999) N</td>
</tr>
<tr>
<td>informal 59</td>
</tr>
<tr>
<td>formal 18</td>
</tr>
</tbody>
</table>

$x^2=8.42$ df=1 $P<.01^{**}$

H5: Elders with higher levels of ADL are more
likely to use formal care.

Table 19 shows that approximately 89 percent of
the elderly with lower ADL used informal care and 11
percent used formal care. At the same time 59 percent
of the elderly who have higher ADL used informal care and about 41 percent used formal care. Chi-square test shows that the association between ADL and use of care is significant ($x^2 = 9.55$ df=1 p<.01). The null hypothesis that ADL has no association with the use of care can be rejected.

<table>
<thead>
<tr>
<th></th>
<th>low (0 - 6) N</th>
<th>low (0 - 6) %</th>
<th>high (7 - 12) N</th>
<th>high (7 - 12) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>informal</td>
<td>31</td>
<td>88.6</td>
<td>40</td>
<td>58.8</td>
</tr>
<tr>
<td>formal</td>
<td>4</td>
<td>11.4</td>
<td>28</td>
<td>41.2</td>
</tr>
</tbody>
</table>

$x^2 = 9.55$ df=1 p<.01**

**H6: Married elders are more likely to use informal care.**

Table 20 shows that about 33 percent of unmarried elderly used informal care, and almost 67 percent of the unmarried elderly used formal care, while only 70 percent of the married elderly used informal care, and
30 percent of the married elderly used formal care. Chi-square test shows that the association between marital status and use of care is not significant (Yate's correctional $x^2 = 3.5$, df=1 p>.05). The null hypothesis that marital status has no association with the use of care can't be rejected.

Table 20. Influence of Marital Status on Use of Care

<table>
<thead>
<tr>
<th></th>
<th>unmarried</th>
<th></th>
<th>married</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>informal</td>
<td>1</td>
<td>33.3</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>formal</td>
<td>2</td>
<td>66.7</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

Yate's correctional $x^2 = 3.5$ df= 1 p>.05

H7: Elders of three-generation households are more likely to use informal care.

Table 21 shows that nearly 55 percent of the elderly who live in one or two-generation household used informal care, and about 45 percent used formal
care. At the same time 75 percent of the elderly who live in three-generation household used informal care and 25 percent used formal care. Chi-square test shows that the association between number of generations and use of care is significant ($x^2 = 4.11$ df=1 $p<.05$). The null hypothesis that the number of generations has no association with the use of care can be rejected. The hypothesis that the number of generations has association with the use of care was accepted.

Table 21. Influence of Number of Generations on Use of Care

<table>
<thead>
<tr>
<th></th>
<th>one-two-generation</th>
<th>three-generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N  %</td>
<td>N  %</td>
</tr>
<tr>
<td>informal</td>
<td>17  54.8</td>
<td>54  75</td>
</tr>
<tr>
<td>formal</td>
<td>14  45.2</td>
<td>18  25</td>
</tr>
</tbody>
</table>

$x^2 = 4.11$ df= 1, $p < .05^*$
H8: Elderly with spousal caregivers are more likely to use informal care.

Table 22 shows that nearly 68 percent of the elderly who has no spouse caregiver used informal care and about 32 percent used formal care. Approximately 72 percent of the elderly who have a spousal caregiver used informal care and about 28 percent used formal care. Chi-square test shows that the association between spouse caregiver and use of care is not significant ($x^2 = .19$ df=1 p$.05$). The null hypothesis that spousal caregiver has no association with the use of care can’t be rejected.

<table>
<thead>
<tr>
<th>Caregiver Relationship</th>
<th>nonspouse</th>
<th>spouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>informal</td>
<td>48</td>
<td>23</td>
</tr>
<tr>
<td>formal</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>N</td>
<td>67.6</td>
<td>71.9</td>
</tr>
<tr>
<td>%</td>
<td>32.4</td>
<td>28.1</td>
</tr>
</tbody>
</table>

$x^2 = .19$ df= 1 p$.05$
H9: Elders who own their homes are more likely to use informal care.

Table 23 shows that nearly 65 percent of the elderly who do not own a house used informal care and 35 percent used formal care, while nearly 74 percent of the elderly who own houses used informal care and about 26 percent used formal care. Chi-square test shows that the association between the owner of the house and use of care is not significant ($x^2 = .96 \quad \text{df}=1 \quad p>.05$). The null hypothesis that owner of the house has no association with the use of care can't be rejected.

<table>
<thead>
<tr>
<th></th>
<th>non-owner</th>
<th></th>
<th>owner</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>informal</td>
<td>37</td>
<td>64.9</td>
<td>34</td>
<td>73.9</td>
</tr>
<tr>
<td>formal</td>
<td>20</td>
<td>35.1</td>
<td>12</td>
<td>26.1</td>
</tr>
</tbody>
</table>

$x^2 = .96 \quad \text{df}=1 \quad p>.05$
H10: Elders with more secondary caregivers are more likely to use informal care.

Table 24 shows that approximately 67 percent of the elderly who have up to 3 secondary caregivers used informal care and nearly 33 percent used formal care. At the same time nearly 77 percent of the elderly who have 4 to 7 secondary caregivers used informal care and about 22 percent used formal care. Chi-square test shows that the association between number of secondary caregivers and use of care is not significant ($x^2 = .80$ df=1  p>.05). The null hypothesis that number of secondary caregivers has no association with the use of care can't be rejected.

<table>
<thead>
<tr>
<th>Table 24. Influence of Number of Secondary Caregiver on Use of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>informal</td>
</tr>
<tr>
<td>formal</td>
</tr>
</tbody>
</table>

$x^2 = .80$ df=1  p > .05
H11: Caregivers with higher education are more likely to use formal care.

Table 25 shows that about 74 percent of the elderly with lower educational level of caregivers used informal care and 26 percent used formal care. About 33 percent of the elderly with higher educational level of caregivers use informal care and almost 67 percent of the elderly use formal care. Chi-square test shows that the association between the caregiver's educational level and use of care is significant ($x^2 = 6.28$ df=1 $P<.05$). The null hypothesis that caregiver's educational level has no association with the use of care can be rejected.

<table>
<thead>
<tr>
<th>Table 25. Influence of Caregiver's Educational Level on Use of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>low (1 - 2)</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>informal</td>
</tr>
<tr>
<td>formal</td>
</tr>
</tbody>
</table>

Yate's correction $x^2= 6.28$ df= 1, $P< .05*$
H12: Caregivers with higher level of burden are more likely to use formal care.

Table 26 shows that 76 percent of the elderly with low caregiver burden used informal care and 24 percent used formal care. Of those with higher caregiver burden, almost 62 percent of the elderly used informal care and 38 percent used formal care. Chi-square test shows that the association between caregiver’s burden and use of care is not significant ($x^2 = 2.27$ df=1 $p > .05$). The null hypothesis that caregiver’s burden has no association with the use of care can’t be rejected.

<table>
<thead>
<tr>
<th></th>
<th>low (0 - 3)</th>
<th>high (4 - 6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>informal</td>
<td>38</td>
<td>76</td>
</tr>
<tr>
<td>formal</td>
<td>12</td>
<td>24</td>
</tr>
</tbody>
</table>

$x^2 = 2.27$ df=1 $p > .05$
H13: Caregivers with higher level of traditional attitudes toward use of formal care are more likely to use informal care.

Attitude toward use of care was selected for univariate analysis before bivariate analysis was made because it is deemed as an important variable pertaining to the model for use of formal care in Taiwan.

Caregiver's attitude toward use of care is an important message in considering the future direction of dependent elderly care in Taiwan. Table 27 shows the caregiver's attitude toward use of formal care. Ninety-five percent of the caregivers agreed that it is the family's responsibility to take care of dependent elderly. Approximately 42% of the caregivers agreed that institutional care is against Chinese filiality. Forty-five percent disagreed that institutional care is good for disabled elderly; and 43% agreed that institutionalization of the disabled elderly will incur blame from others. It should be noted that 50% of the respondents agreed that institutionalization of the elderly is good for the elderly's family. Half of the respondents agreed, compared to about 28 percent who
disagreed that institutionalization of the elderly is good in terms of the well-being of the family. These findings show that caregivers experience conflict in taking care of both the elderly and the rest of family members. Institutionalization of the disabled elderly is not viewed as a stigma by almost 57% of the caregivers. If the categories of no comment and disagree were added together for items 2, 3, 5, more than half (58%, 55%, and 57% separately) of the caregiver respondents did not agree that institutional care is against Chinese filiality; is not good for disabled elderly; and will incur blame from the others.

The majority of respondents (81.6%) agreed that the government has responsibility to take care of the dependent elderly. There seems a conflict between the responses to family’s responsibility and the government’s responsibility in taking care of the disabled elderly. In fact, part of the responses to the government’s responsibility for disabled elderly are conditional. They indicate specifically that the government has the responsibility to take care of those disabled elderly who have no family caregivers or those who live with low-income households. The other part of
the responses highly expect the government to share the responsibility of caring for the dependent elderly by establishing public nursing homes to provide affordable institutional care. This indicates the potential demand for institutional care.

Table 27. Percentage of Attitude toward Use of Formal Care

<table>
<thead>
<tr>
<th>Item</th>
<th>Agree</th>
<th>No Comment</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It is the responsibility of the family to take care of the impaired elderly.</td>
<td>55.1</td>
<td>3.9</td>
<td>1.0</td>
</tr>
<tr>
<td>2. Send the functional impaired elderly for institutional care is against the Chinese tradition of filiality.</td>
<td>41.8</td>
<td>28.1</td>
<td>30.1</td>
</tr>
<tr>
<td>3. For the functional impaired elder's good, it is not appropriate to send him for institutional care.</td>
<td>44.7</td>
<td>23.3</td>
<td>32.0</td>
</tr>
<tr>
<td>4. For the elder's remained family member's good, it is not appropriate to send the elder for institutional care.</td>
<td>28.2</td>
<td>22.3</td>
<td>49.5</td>
</tr>
<tr>
<td>5. People will scold those family who send elderly for institutional care.</td>
<td>42.8</td>
<td>16.5</td>
<td>40.8</td>
</tr>
<tr>
<td>6. Government take the responsibility of taking care of the disabled elderly is necessary.</td>
<td>81.6</td>
<td>10.7</td>
<td>7.8</td>
</tr>
</tbody>
</table>
Table 28 shows the result of bivariate analysis that nearly 60 percent of the elderly whose caregiver with low score (10-17) on attitude toward use of formal care used informal care and 40 percent used formal care. While about 74 percent of the elderly whose caregiver with high score (18-25) on attitude toward use of formal care used informal care and nearly 26 percent used formal care. Chi-square test shows that the association between caregiver’s attitude toward use of formal care and use of care is not significant ($x^2 = 2.42$ df=1 $p > .05$). The null hypothesis that caregiver’s attitude toward use of formal care has no association with the use of care can’t be rejected.

<table>
<thead>
<tr>
<th></th>
<th>low (10-17)</th>
<th>high (18-25)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>informal</td>
<td>22</td>
<td>59.5</td>
</tr>
<tr>
<td>formal</td>
<td>15</td>
<td>40.5</td>
</tr>
</tbody>
</table>

$x^2 = 2.42$ df= 1 $p > .05$
H14: Caregiver's satisfaction is related to the use of care.

Table 29 shows that among 103 cases, 73% were satisfied with the use of care, 27% were not satisfied with the use of care. In the group of using formal care, 69% were satisfied with the formal care while 31% were not satisfied. In the group of using informal care, 75% were satisfied with the informal care while 25% were not satisfied. Chi-square test shows that the association between use of differential care and satisfaction level is not statistically significant ($x^2 = .39$, $p = .53 > .05$). The null hypothesis that there is no association between use of care and satisfactory level can't be rejected.

<table>
<thead>
<tr>
<th>satisfaction</th>
<th>formal care</th>
<th>informal care</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>satisfied</td>
<td>22</td>
<td>69%</td>
<td>53</td>
</tr>
<tr>
<td>unsatisfied</td>
<td>10</td>
<td>31%</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>100%</td>
<td>71</td>
</tr>
</tbody>
</table>

$x^2 = .39$, df = 1, $p = .53 > .05$
The open-question about the reasons that caregivers' have about satisfactory and unsatisfactory care of the dependent elderly were analyzed by classifications of the responses.

Informal Care

The reasons underlying caregiver’s satisfactions with informal care include the following:
A). Twenty-six caregivers reported that the elderly’s health condition was stable and/or improved under family care,
B). Seventeen caregivers reported that informal caregiving enabled them to accomplish the filial responsibility of taking care of the elderly,
C). Ten caregivers reported that the elderly could enjoy family life.
D). Four caregivers reported that they had adequate caregivers to take care of the disabled elderly

The reasons that accounted for dissatisfaction of caregivers include:
A). Sixteen caregivers reported they experienced unendurable heavy burden (interrupted sleep,
restriction on freedom, worry about the elderly while out),
B). Eight caregivers reported that they were unable to work and thus incomes decreased,
C). Four caregivers reported they had insufficient knowledge about taking care of, and rehabilitating the dependent elderly,
D). Three caregivers reported that they were unable to afford institutional care,
E). One caregivers reported the inconvenience of an apartment building which limited the elder’s access to outside.

**Formal care**

The reasons for caregiver satisfaction with the formal care included the following:
A). Ten caregivers reported that the elderly can get professional and skilled nursing care at the nursing home,
B). Four caregivers reported the family has greater flexibility of time and schedule,
c). Three caregivers reported that they don’t have to worry about the elders because they have companions,
D). Two caregivers reported they have family to share the expense with them.

However, the reasons caregivers gave for dissatisfaction with the formal care include:

A). Twelve caregivers reported poor quality of care, including unqualified staff, facility and environment of both public and some private nursing home,

B). Three caregivers reported they were unable to afford for formal care, either home care or institutional care on long-term basis,

c). Two caregivers reported that the elderly who stayed in the nursing home did not have family’s companionship,

D). Two caregivers reported that they feel unfilial to their elders.
Multivariate Analysis

Logistic regression was chosen as the statistical method for multivariate analysis of the data because the dependent variable is dichotomous and unevenly distributed. Logistic regression is appropriate for analyzing a dichotomous dependent variable with a combination of categorical and continuous independent variables. Logistic regression coefficients can be interpreted as the effect of each predictor variable on the probability of using long-term care when other variables in the model are controlled.

According to Hosmer & Lemeshow (1989), the appropriateness of the decision to begin with the multivariate model with all possible variables depends on the overall sample size. The traditional approach to statistical model building involves seeking the most parsimonious model that still explains the data. Only variables whose univariate test has a p-value < .25 should be considered for the multivariate model. In this study, only five variables which have a p-value <.25 in Chi-square test were selected and entered into the logistic regression for a parsimonious prediction model of use of long-term care service. These five
predictors were number of generations, household income, caregiver’s educational level, elder’s ADL and caregiver’s attitude.

Table 30 shows the result of logistic regression of use of care on five predictors. When these five predictors are all included in the model, only household income, and ADL were significantly associated with the use of care, while number of generations, caregiver’s educational level and caregiver’s attitude were not significantly associated with the use of care.

This model shows that a unit increase in household income will increase the logit for use of formal care by .29, which supports the hypothesis that elders with higher household income are more likely to use formal care. Higher ADL score indicates poorer functioning; a unit increase in ADL will increase the logit for use of formal care by .21, which supports the hypothesis that elder with higher ADL are more likely to use formal care.
<table>
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<td>number of generations</td>
<td>-.99</td>
<td>.54</td>
</tr>
<tr>
<td>caregiver’s attitude</td>
<td>-.11</td>
<td>.09</td>
</tr>
<tr>
<td>household income</td>
<td>.29*</td>
<td>.15</td>
</tr>
<tr>
<td>caregiver’s education</td>
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<td>.37</td>
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<td>ADL</td>
<td>.21**</td>
<td>.08</td>
</tr>
<tr>
<td>intercept</td>
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<td></td>
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<tr>
<td>-2 log likelihood</td>
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<td>Degrees of freedom</td>
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</table>

* p<.05  **p<.01
CHAPTER V

CONCLUSION AND IMPLICATION

Conclusion

This study applied the Andersen and Newman service utilization model, extended by Bass and Noelker, to an analysis of a sample of elderly stroke patients and their family caregivers in Taipei metropolitan area. The research questions focused on the characteristics of both elderly stroke patients and their caregivers who use formal and informal care, as well as on the caregiver’s satisfaction level with long-term care services.

Summary of Results

Both the bivariate and multivariate analyses in this study found that higher household income and higher ADL scores are the major characteristics of the disabled elderly who used formal care in Taiwan. The
data did not support the hypothesis that older elderly, male elderly and insured elderly are more likely to use formal care.

The finding that income is one of the strong predictors of formal care use in Taiwan in both the bivariate and multivariate analyses was not surprising given the domination of the private sector in the current long-term care system in Taiwan. In a U.S. study, Cantor (1979) found that low SES families were more likely to give assistance to their elders than were high SES families. Perlman and Giele (1983) indicated that caregiving families were more likely to have low incomes.

As with findings in other studies, ADL is an important predictor of formal care use in this study. The elderly with more severe functional impairment used more formal care. Litwak (1985) predicted that if disability progresses to the point that the person needs 24-hour care, the best environment is a nursing home. Thus, ADL of elderly stroke patients can be used to predict the need for formal care services in Taiwan.

The gerontological literature has shown that age is related to level of disability and is a significant
factor in predicting use of formal care in the United States. While prior studies have shown that age and level of disability are related in the Taiwanese elderly population, age did not prove significant in predicting use of formal care services in this sample of elderly stroke patients in Taipei metropolitan area. This finding is explained by the fact that the sample was selected using criteria of disability and diagnosis as well as age. Therefore, the relationship between age and level of disability is artificially suppressed in this sample.

In this study, gender did not influence the use of formal care. This may be due to the fact that only 11.7% of the sample were veterans, a much lower percentage than was originally estimated. In addition, the majority of these veterans were married and had spousal caregivers. Had the sample included a larger percentage of veterans whose special treatment covers long-term care and a larger percentage of unmarried veterans, the gender variable may have been significant.

The hypothesis that insurance covered elderly are more likely to use formal care was not supported by
this study despite the fact that some insurance/benefit programs include payment for formal care, primarily home health care. The possible explanation is that coverage for formal care by insurance/benefit program alone does not significantly influence the use of care. The range of coverage, the user's knowledge of and the user's access to the program may also have an effect on the use of care. The caregiver's educational level affected the use of formal care in bivariate analysis in this study and adds further support to this explanation. This point will be addressed more fully in a later section.

Bivariate analysis found that the number of generations residing in a household is associated with the use of formal and informal care. Nevertheless, multivariate analysis showed that number of generation household is not a significant predictor for the use of informal care. This finding suggests that although multiple generation households are associated with the use of care, this relationship disappeared when other variables like household income and ADL are taken into consideration. Therefore, there is no evidence to support the hypothesis that disabled elderly who live
in three-generation households are more likely to use informal care. Thus, advocates of the three-generation household as a mainstay of family care policy in Taiwan need to reconsider their position regarding disabled stroke patients in light of these data.

There is no evidence in this study to support that married elderly, elderly who own their homes, elderly with spousal caregivers and with secondary caregivers are more likely to use informal care.

The hypothesis that married elderly will use more informal care was not supported by the study. Perhaps one reason for this finding is the small number of the unmarried elderly in this sample (3 out of 103). There are several explanations for the small number of unmarried people in this sample. DGBAS’s study (1988) showed that about 22 percent of the disabled elderly who lived alone stayed in the hospital for long-term care. Nearly 12 percent returned home, but had nobody to take care of them. People who were hospitalized or people without caregivers were excluded from this sample.

The hypothesis that elders with spousal caregivers are more likely to use informal care was not supported
by this study. The possible explanation is that those spousal caregivers of the stroke patients are too old to care for their spouses. This finding is consistent with that of DGBAS (1988), which found that among those disabled elderly who live with a spouse, about 6.4 percent stay in the hospital and 2 percent stay in a medical treatment center. Therefore, there are more than 8 percent who lived with their spouse, but stayed in an institution for an extended stay. The proportion of elderly who lived with their spouse and staying in institutions for long-term care is high compared to those disabled elderly who live with children and live with relatives and friends.

The finding that home ownership was not a significant predictor of use of care for elderly stroke patients may suggest the weakness of the ownership measure. The elder may still be the owner of the house because he or she is the one who offered the money to buy the house, even though the title of the house is not in his or her name.

The hypothesis that elderly with more secondary caregivers are more likely to use informal care was not supported. Sussman (1976) suggests that secondary kin
caregivers may increase the utilization of formal care by mediating and brokering services for the elder. It is also possible that the use of informal care is related to the number of caregiving tasks assisted by the secondary caregiver rather than the number of secondary caregivers.

Caregiver’s educational level is associated with the use of care in bivariate analysis. However, the caregiver’s educational level is not a significant predictor in the use of care in multivariate analysis, which means the association between caregiver’s educational level and use of care disappeared when other variables were taken into consideration.

The hypothesis that elderly with higher caregiver burden are more likely to use formal care in Taiwan is not supported by this study. This research found that some elderly entered nursing homes or used paid care immediately after discharge from the hospital. For the families of these patients, it can be assumed that caregiver burden was relieved by formal care services. This may explain why caregiver’s burden is not associated with the use of care.
There is no evidence to support the hypothesis that caregivers with higher levels of traditional attitudes toward use of formal care are more likely to use informal care. This finding may be attributable to the items in the attitude scale. The variable "formal care" used in this study encompasses institutional care and home care. However, four out of six items focused on attitudes toward institutional care. None of the items specifically asked about attitudes toward home care. Thus, the validity of the scale for the formal care is questionable. This finding may also express the conflict between traditional social norms and individual preferences. Some individuals may prefer formal care use, but did not use it because of their inner conflict or guilt feeling caused by Chinese tradition of filiality. It may also be due to the fact that families do not have resources to pay for formal care, a fact the caregivers mentioned in their reasons for dissatisfaction with both formal and informal care.

More than half of the caregivers did not view institutional care for the disabled elderly as unfilial, inappropriate, or stigmatizing. This finding may be the result of suffering experienced by
caregivers in taking care of the elderly, or may reflect the increasing change of attitude toward use of institutional care.

This study did not show a relationship between caregiver’s satisfaction and the use of formal and informal care. The analysis of reasons caregivers gave for their satisfaction or dissatisfaction with their care arrangements showed that satisfaction levels are related to two issues— the well-being of elderly, and the well-being of family.

In general, the major reasons given in relation to the well-being of the elderly encompassed the elderly’s health condition and the quality of care, either institutional care, home care or family care. The caregiver feels satisfied if the elderly’s health condition was kept stable or improved by quality care. Reasons related to the well-being of family primarily involved the caregiver’s burden along with income decrease or expenditure increase. Most of the caregivers who use informal care feel dissatisfied because they feel so burdened. At the same time they are unable to afford formal care.
Limitation of Generalizability of the Findings

The sampling frame in this research contains only those elderly stroke patients who were discharged from hospitals with moderate to severe functional levels, and lived in Taipei metropolitan Area. According to DGBAS (1990), more than nine percent of the dependent elderly stayed in the hospital for long-term care. This group was not included in this study. Thus, the generalizability of the findings in this study are limited to the population of dependent elderly stroke patients who were discharged from hospitals with moderate to severe functional level and live in Taipei metropolitan area. The findings cannot be generalized to other areas of Taiwan. Similarly, the findings cannot be generalized to elderly who use long-term care for health problems other than stroke. The generalizability of the findings in this study remains limited to married elderly because very few elders in this sample were not married.
Implications

The findings of this study raise important concerns for theory, policy planning, program design and practice and for future study.

For Theory

Although many factors in this study were not found significantly related to the use of care in Taiwan, the model used in this study was found to be applicable to Taiwan. The data found that predisposing (number of generations in a household), enabling (household income and caregiver's educational level) and need (ADL) factors affect the use of formal and informal care. Thus the model adapted from Western society can be applied to studies of long-term care utilization in Taiwan. The model allows researchers to have more confidence in generalizing findings of studies using this model to the problems of long-term care in Taiwan. It also presents a conceptual framework for future studies on long-term care in Taiwan and facilitates the development of a research agenda for model development and enhancement for studies on long-term care in Taiwan.
One of the criticisms of the model's use in Western society is the lack of variables which capture cultural attitudes towards use of long-term care services. This study provides data which illuminates the role of culture and attitudes toward care as an important component of the model which needs further development. Despite the fact that this study found no significant association between attitude toward care and the use of care, future studies in the cultures other than Western society should continue to test the model and continue to expand it to include cultural factors as the predisposing variables. Thus, the relationship between attitude toward care and the use of care can be better understood.

The multivariate analysis further found that an enabling factor and a need factor outweighed predisposing factors in the model of use of care in Taiwan. That is, the use of care in this sample is a function of an enabling factor and a need factor rather than the function of predisposing factors. The disappearance of the relationship between three-generation household and the use of care in the multivariate model indicates that while an elder lives
in a three-generation household (predisposing factor) and has the propensity to use informal care, he or she will not be able to do so when household income is limited and ADL is impaired. This finding lends support to Andersen and Newman’s model that enabling factors facilitate the use of care but need is the basic and direct stimulus for the use of care.

This study applied the model to a subpopulation of the elderly who are in need of long-term care services. To fully explicate the model’s utility in Taiwan, further studies are needed on population based probability samples.

**For Policy**

As the demography, health condition of the elderly and social condition in Taiwan change, the role of formal and informal care in the long-term care system becomes a significant policy issue. The findings of this study help explicate how formal and informal care are used in Taiwan, and the characteristics of the elderly and caregivers who use these two categories of care.
This study found that more than 30% of the disabled elderly stroke patients used formal care. Nearly 20% of them had experienced institutional care sometime after discharge from the hospital. Nearly 17% had used paid care. DGBAS's (1990) survey of the dependent elderly found that only 2.7% of the dependent elderly used some form of institutional care and 4.2% of them used paid care after discharge from hospital. In this survey, less than 7% of the dependent elderly used formal care. The comparison of the percentage of use of formal care of two studies shows that elderly stroke patients used and, very possibly needed more formal care service in Taipei metropolitan area than other disabled elderly in other areas of Taiwan. It might also imply that the increasing rate of use of formal care in Taiwan in the last three years surpasses the current estimations. This finding further highlights the importance of a long-term care policy and the balance of formal and informal care in Taiwan, especially in the Taipei metropolitan area.

Although attitudes toward the use of care were not associated with service utilization in this study, the results of the attitude scale found a more positive
attitude toward institutional care than expected. The current policy in Taiwan views formal care as supplemental to informal care. The determination of the proper balance of formal and informal care and the development of policy will require that the government understand how and why the need for and attitude toward long-term care services are changing.

The interior Ministry indicates that the elderly and the disabled are two of the priority groups for the Social Welfare Department during the next six years (Central Daily News, 1992). The Minister of the Interior Ministry expressed the view that in light of the influence of social change and other non-economic factors, the Central Government will encourage and subsidize elderly home or elderly apartment (Central Daily News, 1992). The results of this study can inform these efforts. The three-generation household has been the mainstay of family care policy. Given this study’s findings, policy-makers must re-examine the role of family care in the future aging policy in Taiwan. The Minister’s recent claim explicitly shows a recognition of the fact that connotation of acceptance
of the three-generation household will only be one part of future family care policy for an aging society.

Future aging policy must also include the caregivers, those who are affected by a chronic disability and who have accepted and acted on the role of caregivers to an elderly family member. Caregivers appear to understand the advantages of family caregiving: it benefits the elderly and keeps the tradition of Chinese filiality. However, caregivers also understand the disadvantages: decrease in family income, restricted activities, and negative impacts on other family member’s well-being.

Formal care is not without risks as well. Poor quality of care, the cost of care and the family’s guilt feelings may overshadow the advantages of skilled nursing and more flexible schedule of formal care use. The study also showed that caregivers turned to the government for affordable and quality long-term care services.

The increases in the number of the elderly, increases in life expectancy of the elderly, decreases in the numbers of persons per household and decreases in the numbers of elderly who live with their children
will serve to influence the public's attitudes about who should be responsible for the care of the disabled elderly. DGBAS (1990) indicates that the public ranked the establishment of nursing homes as the second priority, next to the medical care only, for government response to the needs of the elderly by the respondents aged beyond twenty-five. The caregivers' positive attitude toward the use of formal care reflects their preference for a system of government provided or government financed long-term care.

The finding that income affects use of care in Taiwan indicates inequality and access problems in long-term care. In this study only the elderly with higher incomes could afford formal care. Many of those who used formal care did so by depleting their savings.

The finding that elder's health insurance is not associated with the use of care may also indicate the need for an expansion of insurance coverage for long-term care. In this study, almost 16% of the sample were insured by the farmer's insurance. However, farmer's insurance does not cover the payment for any long-term care services. None of the current insurance
programs in Taiwan cover the payment of use of institutional care.

Most of today's caregivers will be the tomorrow's elderly. Thus the expectation expressed in this study by the caregivers can be received as the expectations of future elderly. Need, as defined by these caregivers should be taken into account in planning services for the frail elderly. Since the family is the major source of caregiving for the elderly in Taiwan, it is important that policy be formulated which views the elderly in the context of family network, considering the caregivers' needs as well as those of the elderly. Public programs should be reviewed to determine any negative effect on the family support system.

The finding that ADL is associated with the use of care and that elderly with higher ADL are more likely to use formal care suggest that ADL can be used to identify formal care needs of the disabled elderly. Litwak (1965, 1978) argues that the dependency needs of the elderly are best met if there is a proper balance between formal and informal support, with each system performing the tasks for which it is best suited. For
severely impaired dependent elderly, institutional care is often the service of choice. Therefore, the establishment of nursing homes with good quality care is still needed in Taiwan.

From the findings discussed above, this study suggests that, under the current situation, income and ADL override other factors that determine the use of care in Taiwan. Therefore, the expansion of formal care by the public sector for middle-low-income families is necessary. One option is for the public sector to include long-term care service in medicaid and to enlarge the coverage of health insurance to cover long-term care. In this way, public policies could facilitate access to formal services in situations of high need.

**For Program Design and Practice**

The findings of this study provide useful information for clinical social workers to identify the needs of elderly stroke patients and their caregivers and to design appropriate programs for them.
The program of Financial Assistance to Home Care provided by Taipei City Government targets middle to low-income households. Taipei County Government also dispatches volunteers who provide home care services to elders in low-income families. Services such as these can balance the effect of income on use of formal care and increase equality of access to long-term care service. However, this study found that no one received this benefit despite the fact that approximately 38% of the sample met the income criteria of NT$ 8,000 per capita monthly income for this program.

This study found that caregiver's educational level was associated with the use of formal and informal care. Nearly 88 percent of the caregivers had less than a high school education. This large proportion of caregivers are in need of information to increase access to formal care service. Thus, in programs and service options for the elderly and their caregivers, the social worker needs to take the initiative in screening the clients and providing information about available resources. In this sense, hospital social workers have the greatest responsibility to make
contact with the caregivers before elderly stroke patients are discharged from the hospital. For those dependent elderly already discharged from the hospital, the government social worker’s role in the promotion of existing available programs for formal care is especially important. A well-coordinated system between hospital, community services and home care programs is needed in Taiwan.

The analysis of the reasons for satisfaction level with alternative use of care reflects that no single choice of care can satisfy all caregivers. These findings may also imply that more care options are needed. In a dynamic sense, long-term care is a continuum of care which may begin with the home, involve an episode of hospitalization, find the patient in some sort of extended care facility and end with the patient back at home and with the possibility of movement back and forth in the continuum of care. Thus, in order to meet the various needs of both the dependent elderly and the elderly’s family, various types of programs and services, such as respite care, support group for stroke elderly’s caregivers,
educational programs teaching skills in caring for the dependent stroke elderly need to be developed.

The problem of quality of institutional care has been indicated by professionals before (SWD, 1987; Lee, 1989). This issue is further identified by the caregivers who had used or visited nursing homes. Quality control for institutional care is an area which the Health Department should pursue rigorously.

**Implication for Future Research**

As indicated in the chapter I, very few studies have been done in the area of long-term care of the disabled elderly in Taiwan. Although the study has made an initial attempt to document the characteristics of the disabled elderly and their caregivers who use formal and informal care, the relationships between the demand for care and demographic characteristics, patterns of culture as well as social structure are not yet clear.

This study shows that there are both similarities and differences in the characteristics of the disabled elderly and their caregivers who use formal and
informal care in the United States and Taiwan. These findings remind us of the importance of cross-cultural research. They also remind us to be cautious in the application of findings about long-term care utilization to another culture. Further caution is advised in applying related findings existing in the literature of the United States to the Taiwanese population or to other culture.

In order to develop appropriate social policy and service program for the disabled elderly in Taiwan, studies based on randomly selected samples of the disabled elderly population in Taiwan area need to be done. The same research methodology might be applied in order to extend or test the generalizations and reliability of the findings of this study. These kinds of studies could complement the small but growing body of knowledge on the elderly in Taiwan.

Future studies on the use of long-term care in Taiwan should include both institutional care and home care to clarify the differences in service use. Comparison studies between characteristics of the institutionalized, including those who stayed in the hospitals for long-term care, and those who use family
care could also provide useful information and understanding about the use of long-term care service in Taiwan. Follow up studies of those disabled elderly who live alone without caregivers are of special value in terms of the most needy dependent elderly.

Despite the fact that most of elderly stroke patients are still within the family, the attitude of younger generation, healthy elderly, disabled elderly as well as general population other than caregivers toward formal care requires our continuing attention and study. The use of a standard attitude scale to understand views of the public about the future development of long-term care utilization in Taiwan, as well as the differences in attitudes between different populations is a necessary next step in long-term care research in Taiwan.
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APPENDIX A

QUESTIONNAIRE

Dear sir:

We are doing a study to learn about the effect factors on long-term care alternatives of impaired stroke elderly. The study is sponsored by ____________ . The result of this study could be used to provide the information for policy making concerning the welfare of the disabled elderly and their family caregivers. The subject has been selected by random sampling procedure from Stroke Patients Registry in Taiwan Area. We would like to have primary caregiver to answer the following questions. It will take you 30 minutes to participate.

While your participation is extremely important to the overall accuracy of the study, the survey is completely voluntary. Your name and answers will be kept completely confidential. Thanks for your help.

1. What is the elder's birthday? year_____ month_____ 

2. What is the elder's gender? Male_____ Female_____ 

[Page Number] 141
3. Is the elder single, married, widowed, divorced, or separated?
   single____
   married____
   widowed____
   divorced____
   separated____
   not answered____

4. What is the health insurance/benefit of the elder?
   farmer insurance____
   official insurance and attached insurance____
   special treatment to veteran____
   military insurance____
   labor insurance____
   Medicaid____
   private insurance____
   uninsured____

5. Before hospitalization, the elder lives with:

   (multiple choice)
   no one____
   husband or wife____
daughter______
son______
daughter-in-law______
grandchildren______
brothers and sisters______
other relatives______
friends______
non-related paid helper______
other______
not answered______

6. Number of generations before hospitalization:
   one-generation household _____
   Two-generation household _____
   three-generation household _____

7. Does the elder own the house he has been living in ?
   Yes____ No____

8. When was the elderly discharged from the hospital for treatment of the stroke ?
   year_____ month______
9. Where did the elder go to live after discharge?
   private nursing home____
   public elder or nursing home____
   veteran's home____
   veteran's hospital____
   his/her own home____
   other (please specify)____

10. The elderly currently stays in
    private nursing home____
    public elder or nursing home____
    veteran's home____
    veteran's hospital____
    his/her own home____
    other (please specify)____

11. When did the elder move to this place?  year____
    month____

12. Please estimate how much income per capita in the
    household per month, including overtime pay, bonuses
    and commissions, income from rent, interest,
    dividend:
NT$ 0 to 2,999
NT$ 3,000 to 7,999
NT$ 8,000 to 12,999
NT$ 13,000 to 17,999
NT$ 18,000 to 22,999
NT$ 23,000 to 27,999
NT$ 28,000 to 32,999
NT$ 33,000 or more
DONT KNOW

13. Who is the elder's primary caregiver now?

spouse____
son____
daughter____
son-in-law____
daughter-in-law____
grandchildren____
sister and brother____
other relatives____
friends____
paid helper____
home health care nurse____
other____
14. who is the decision-maker in the elder’s family?
   spouse____
   son____
   daughter____
   son-in-law____
   daughter-in-law____
   other________________(please specify)

If elder lives in institution, please follow question 20.
If elder lives at home, please follow question 15.
15. How many hours per week does the primary caregiver spend for the elder? ________ hours/wk.

16. Does the elder have other secondary family caregivers that help ADL tasks available in addition to the primary caregiver?
   If yes, how many secondary caregivers____
   no______.

17. Does the elder have paid helper? yes____ no____
   If yes, what kind of tasks does she/he help the elder?
   feeding_________
dressing
toileting
getting in and out of bed
bathing
home health care

18. how many hours per week does she/he spend for the elder? _____ hrs/wk

19. how much does the family pay per month for the elder care? NT$_____ per month

20. How would you evaluate the elder's function at the time you decide to use family care or institutional care? 0= without any help, 1= with some help, 2= completely unable to do activity.
   a. Can the elder feed him/herself?
   b. Can the elder dress and undress him/herself?
   c. Can the elder go toileting?
   d. Can the elder get in and out of bed?
   e. Can the elder take a bath?
   f. Can the elder control continence?
21. What was the highest grade you finished in school?

1. 0 to 12 years____
2. post high school, business school____
3. college or university completed____
4. post graduate school____

22. Providing care to the elderly, you feel that

<table>
<thead>
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<th>yes</th>
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<tbody>
<tr>
<td>1. my health get worse</td>
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</tr>
<tr>
<td>2. cost of care more than</td>
<td></td>
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<tr>
<td>I could afford</td>
<td></td>
</tr>
<tr>
<td>3. I need to provide care when</td>
<td></td>
</tr>
<tr>
<td>not feeling well</td>
<td></td>
</tr>
<tr>
<td>4. I have emotional strains</td>
<td></td>
</tr>
<tr>
<td>5. I get limitations on social</td>
<td></td>
</tr>
<tr>
<td>activities</td>
<td></td>
</tr>
<tr>
<td>6. the elder needs constant</td>
<td></td>
</tr>
<tr>
<td>attention</td>
<td></td>
</tr>
</tbody>
</table>

23. In the following questions, the elder refers to
moderately or severely functional impaired elder.

What is your response to these questions?
5= strongly agree, 4= agree, 3= neither agree, nor disagree, 2= disagree, 1= strongly disagree.

a. It is the responsibility of the family to take care of the functional impaired elderly.

b. Send the functional impaired elderly for institutional care is against the Chinese tradition of filiality.

c. For the functional impaired elder's good, it is not appropriate to send him for institutional care.

d. For the elder's remained family member's good, it is not appropriate to send the elder for institutional care.

e. People will scold those family who send elderly for institutional care.

f. Government take the responsibility of taking care of the disabled elderly is necessary.

24. Are you satisfied with current placement of your elder?

Yes____  No_____
25. What makes this decision satisfied or not satisfied? Please specify__________________________