JOURNAL OF POPULATION AND SOCIAL STUDIES Volume 14 Number 2 January 2006

Improvement of the Quality of Life of the Elderly through Individual Empowerment, Family Care and Community Support: The Case of Phra Nakhon Si Ayutthaya Province, Thailand

Srimuang Paluangrit *
Frits van Griensven **
Kua Wongboonsin ***

Introduction

In Thailand, changes in population growth will have a profound impact on the population composition and are driven by changing fertility rates over the past four decades. The proportion of the population below 15 years of age is projected to decline from 24.6 percent in 2000 to 17.9 percent in 2025. More importantly, Thailand will see a substantial increase in the proportion of the population aged 60 and above, from 9.4 percent in 2000 to 20.0 percent in 2025 (Wongboonsin and Wongboonsin, 2004: 2).

Consistent with the changes in the population composition described above, the overall dependency ratio, the percentage of those under 15 years old plus those above 59 relative to the labor-force population aged 15-59 years, will increase from 0.5 in 2000 to 0.6 in 2025 (Wongboonsin, Guest and Prachuabmoh, 2004: 5-7).

Life expectancy at birth for women in Thailand is expected to increase from 74.8 years during 2000-2005 to 80.2 years in 2015-2020. Life expectancy for women

* Faculty of Medicine, Thammasat University, Rangsit Campus, Klong Luang, Pathum Thani 12120, Thailand. E-mail: srimuang@tu.ac.th
** Department of Epidemiology and Biostatistics, University of California at San Francisco, San Francisco, U.S.A.
*** College of Population Studies, Chulalongkorn University, Bangkok, Thailand.

aged 60 is projected to increase from 19.4 to 21.9 years over the same period. Similarly, life expectancy a birth for men will increase from 67.1 years during 2000-2005, to 74.7 years in 2015-2020. (Wongboonsin, Guest and Prachuabmoh, 2004: 8).

However, the health and physical condition of the elderly will naturally decrease in correspondence with their age. The elderly are likely to suffer from both communicable and non-communicable diseases and decreased mobility. Results from a national Thai survey among those 60 years and older from 33 provinces, indicated that 72.5 percent suffered from a chronic disease for at least six months in the past years (Jitapunkul et al., 1999: 20). Diabetes, hypertension, arthritis, coronary heart disease, and tuberculosis were the top five conditions among elderly attending 16 out-patient clinics in different areas of the country (9.7, 9.0, 4.9, 3.7 and 3.6 percent, respectively). The top five conditions for in-patients were cataract, gastrointestinal infection, hypertension, diabetes and tuberculosis (8.4, 7.0, 3.8, 3.7, and 3.3 percent, respectively) (Siriphanich, 1999: 188-119). Moreover, 28 percent of beds were occupied by the elderly, around three times that of the younger generation (Office of the Prime Minister, National Commission on Elderly of Thailand, 2002: 18).

Besides these problems, the mental health of the elderly also deserves attention. The elderly are confronted with desertion, loneliness, depression and anxiety, and to such an extent that, at one time or another, some considered suicide (Paluangrit, 1997: 2). Socio-economic and cultural changes in Thailand require younger family members to study or work away form their birth place, which affects the elderly, who traditionally depend on their children during the later stages of life. Institutional and community support may help to reduce the physical and mental health burden on the elderly, but such functions are currently not available (Wongboonsin and Wongboonsin, 2004: 6).

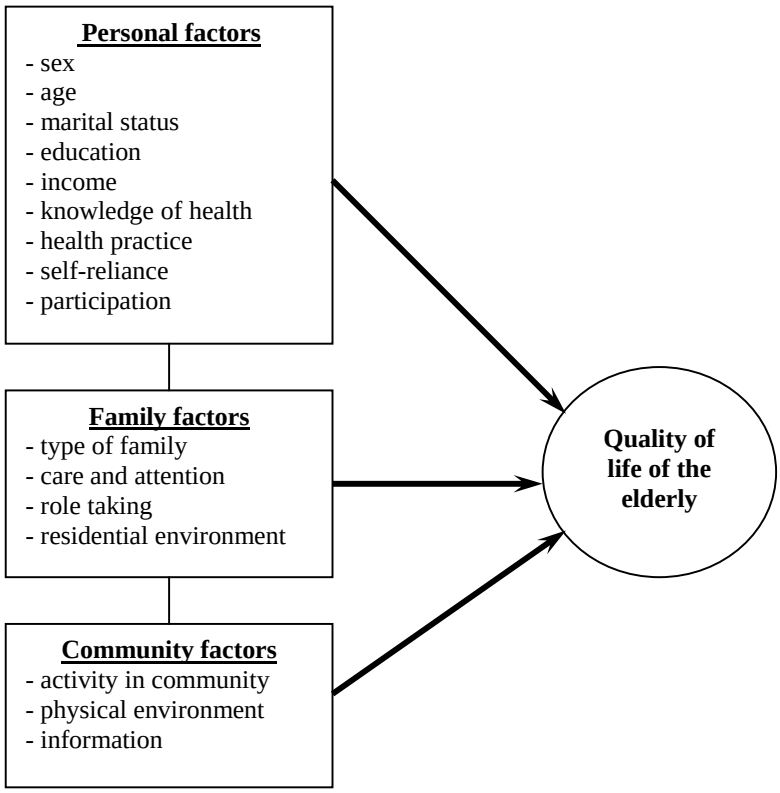
Given the increase in the proportion of elderly in the next two decades, in combination with changes in socio-economic and cultural values, a better understanding is needed of the quality of life (quality of life means satisfaction, well being, happiness, physical health, mental health, good nutrition, capable of sufficient financial means,

clean environment). In this research we used multi-stage probability sampling and quantitative statistical analyses to assess the quality of life of the elderly and to identify factors (individual, family and community) affecting this quality of life (Figure 1).

Conceptual framework

Figure 1

Conceptual framework of this research



Methods

Sampling

We used multi-stage probability sampling to enroll a representative sample of the elderly in Phra Nakhon Si Ayutthaya province. In Thailand, every province is administratively organized according to district, sub-district and village levels. First, we classified the 16 districts of Phra Nakhon Si Ayutthaya province in urban, suburban and rural by their number of population. Second, we randomly selected three out of the16 districts, followed by random sampling of three sub-districts, 14 villages, and then all the elderly in the villages. We enrolled 415 persons of 60 years and over in our sample. Sample size was calculated based on the number of persons needed to say with a 95% degree of assurance that a frequency of 50% found in the sample would be between 45% and 55% in the total population (Agresti and Finlay, 1997: 138-140).

Instruments

A structured interviewer administered questionnaire assessed demographics, family and community factors and quality of life. For the latter an adapted form of WHOQOL-BREF-THAI (Mahatnirankul et al., 1997) was used. In 1996, the World Health Organization (WHO) developed a quality of life scale of 100 items (WHOQOL-100) (The World Health Organization, Division of Mental Health, 1995) for use in different cultures. In the same year, WHO developed a shorter version of 26 items (WHOQOL-BREF) (The World Health Organization, Division of Mental Health, 1996) for field surveys (Appendix). Mahatnirankul et al. (1997) compared the properties of WHOQOL-BREF with WHOQOL-100, and concluded they were exchangeable. We pre-tested a Thai version of the questionnaire in interviews with 30 elderly, and found an Cronbach's alpha coefficient of 0.73. Thus, we concluded that the Thai version was reliable and could be used in our study.

Statistical methods

Data were analysed with SPSS Windows, version 10.0.7 (SPSS Inc, 1998).

Variables:

We assessed 3 groups of factors, personal, family and community, totaling 16 independent variables (Figure 1): sex, marital status, participation, type of family, care and attention, activity in community, and information were assessed on the nominal/ordinal level. Age, education, income, knowledge of health, health practice, self-reliance, role taking, residential environment, and physical environment were assessed on the interval/ratio level (see table 1 for variable values, e.g., male, female; single, married, widowed etc.). The role of the elderly in the family were assessed by summing scores from 3 point scales (never, sometime and often) referring to consulting and advice, training and teaching, decision making, providing income, knowledge transfer and taking care of grand children. Residential environment was assessed by summing scores regarding staircase, doorstep, bathroom/toilet and lighting; community activity in community there is activity for elderly e.g. a group exercise or group meeting for the elderly etc.; physical environment was assessed by summing scores regarding quality of air and dust, waste water, rubbish and noise; information was present of the elderly had access to the media (e.g., radio, TV., newspaper, peer-exchange) general information in the past month. The dependent variable (quality of life) was assessed on an ordinal scale, ranking 1 to 5 (Appendix).

Univariate and multivariate analysis:

Sample characteristics were described for the 3 groups, individual, family and community by frequency, percentage, mean, standard deviation, and minimum and maximum values. We applied factor analysis to the WHOQOL-BREF-THAI to identify dimensions of the quality of life of the elderly. Factor analysis is a data reduction technique that allows to evaluate groups of variables (or answers on questions) that are correlated among each other but as a group do not correlate with other groups of variables. This way we can reduce a large number of questions to a number of relatively independent dimensions, in this case, dimensions of the quality of life of the elderly.

We used a goodness of fit chi-square test to evaluate whether the dimensions of the quality of life retrieved from factor analysis, accurately represented our data (Norusis, 1993; Mendenhall and Sincich, 1996). After identification of the dimensions, we calculated individual scores on each dimension. Scores on the dimensions and other variables were analyzed simultaneously in multiple regression analysis to predict the quality of life of the elderly.

Results

Demographic characteristics

Of our study population 62.4 % were female, their mean age was 70.7 years (range 60 - 89 years) and approximately half of them were currently married (51.8 %). The mean number of years of education was 3.8, and the mean income per month was 2,000 baht (~US$52). Of the elderly, 27.2 % participated in community activities. The mean health knowledge score was 3.4 (out of a total of 10 possible scores). The mean scores of practice of health was 6.3 (out of 11), and self-reliance 13.5 (out of 14) (Table 1).

Table 1: Demographic and other characteristics of the elderly (N=415)

Characters	Percent	Number
Individual		
Sex		
Male	37.6	156
Female	62.4	259
Age groups (years)		
60-64 years	25.3	105
65-69 years	23.6	98
70-74 years	21.9	91
75-79 years	13.5	56
80-84 years	10.8	45
85-89 years	4.8	20
Mean (range) 70.7 (60-89)		

Table 1: (Continued)

Characters	Percent	Number
Currently marital status		
Single	5.1	21
Married	51.8	215
Widowed	40.5	168
Divorced	0.5	2
Separated	2.2	9
Education (years)		
No education (0)	11.3	47
In complete primary school (1-3)	3.6	15
Complete primary school (4)	80.0	332
Complete primary school (7)	2.2	9
Complete secondary school (10)	1.4	6
Vocational (12)	1.0	4
Bachelor (16)	0.5	2
Mean (range) 3.8 (0-16)		
Income per month (baht)		
None	24.1	100
1-1,000	24.1	100
1,001-2,000	18.3	76
2,001-3,000	14.7	61
3,001-4,000	8.9	37
4,001-5,000	4.3	18
5,001 and over	5.5	23
Mean (range) 1,953 (0 – 26,000)		
Participation		
Participate	27.2	113
Not participate	72.8	302
Knowledge of health (scores)		
25 Percentile (2.5)	26.0	108
50 Percentile (5.0)	29.2	121
75 Percentile (7.5)	23.8	99
100 Percentile	21.0	87
Mean (range) 3.4 (0-10)		

Table 1: (Continued)

Characters	Percent	Number
Health practice (scores)		
25 Percentile (5)	34.0	141
50 Percentile (6)	22.9	95
75 Percentile (7)	19.3	80
100 Percentile	23.8	99
Mean (range) 6.3 (1-11)		
Self-reliance (scores)		
100 Percentile	100.0	415
Mean (range) 13.5 (0-14)		

Of the elderly, 61.7 % were living in an extended family, and 97.6 % indicated having receive care and attention from the children. The mean score of role was 5 (out of a total of 12). The residential environment achieved a mean score of 1.9 (out of 4) and the physical environment 1.8 (out of 2). In 30.6 %, the elderly reported to no activity in community, 94.7 %, the elderly received general information (Table 2).

Table 2: Characteristic of the family and the community of the elderly (N=415)

Character	Percent	Number
Family		
Type of family		
Nuclear	38.3	159
Extended	61.7	256
Care and attention		
Received	97.6	405
Not received	2.4	10
Role taking (scores)		
1-5	57.3	238
6-10	42.7	177
Mean (range) 5 (0-10)		

Table 2: (Continued)

Characters	Percent	Number
Residential environment (scores)		
0	2.2	9
1	24.1	100
2	55.7	231
3	18.1	75
Mean (range) 1.9 (0-3)		
Community		
Activity in community		
Yes	30.6	127
No	69.4	288
Physical environment (scores)		
0 (no good)	7.0	29
1 (moderate)	6.7	28
2 (good)	86.3	358
Mean (range) 1.8 (0-2)		
Information		
Yes	94.7	393
No	5.3	22

Assessment of the quality of life of the elderly

Statistical evaluation of the appropriateness of the use of factor analysis showed a significant fit of the factor model against the data (Chi-squre: $X^2 = 2{,}060$, $p < .0001$). Five components of the quality of life of the elderly were identified and labeled as the physical, psychological, environmental, social relation, and satisfaction domains. The physical domain refers to the condition of the body, such as mobility and eyesight; the psychological domain refers to mental health, such as anxiety and depression; the environmental domain refers to conditions outside the individual, such as clean air and

housing. The social relation domain refers to engagement with friends and others. The satisfaction domain refers to the ability to deal with daily life troubles, such as pain and discomfort (Tables 3 and 4).

Table 3: Total variance explained by factor analysis of quality of life of the elderly (N=415)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of variance	Cumulative	Total	% of variance	Cumulative
1	5.306	22.106	22.106	2.899	12.080	12.080
2	1.720	7.166	29.272	2.668	11.117	23.196
3	1.431	5.962	35.234	1.914	7.974	31.171
4	1.322	5.507	40.740	1.741	7.254	38.425
5	1.277	5.320	46.060	1.575	6.562	44.987
6	1.104	4.601	50.661	1.362	5.674	50.661
7	.966	4.027	54.688			
8	.925	3.853	58.541			
9	.886	3.693	62.234			
10	.881	3.670	65.903			
11	.847	3.528	69.432			
12	.761	3.170	72.602			
13	.741	3.088	75.690			
14	.712	2.965	78.655			
15	.647	2.697	81.352			
16	.600	2.502	83.854			
17	.583	2.430	86.284			
18	.557	2.319	88.603			
19	.531	2.212	90.815			
20	.504	2.099	92.914			
21	.484	2.018	94.933			
22	.439	1.831	96.763			
23	.423	1.762	98.525			
24	.354	1.475	100.000			

Table 4: Rotated component matrix of factor analysis of quality of life of the elderly (N=415)

Question No.	Component					
	1	2	3	4	5	6
3	.755				.135	-.112
24	.710	.128		.101	.121	.128
12	.626	.217		.239		.324
10	.570	.200	.216		.256	
25	.385	.316			-.290	.324
22	.376	.158		.273		.349
5	.121	.633	.181	.115	.213	
9		.631	-.287		.263	
23	.222	.580	.132			.134
15		.578	.105	.329	-.125	-.111
7	.298	.509	.387			
17		.496	.132	.325	.216	.212
6	.223	.491	.201	-.103		
21			.676	.278		
16		.270	.548	.107	.160	
20	-.313		.543		.248	.192
8	.305	.225	.533		-.273	
14	.166		.107	.787		
13	.168		.147	.764		
19		.107		.132	.615	.307
4	.139	.176	.108	.123	.576	
2	-.396	-.141			.530	.288
11	.315		.219			.634
18	.269		.256		.129	.612

Note: Questions are listed in the appendix by number

The relation between independent variable and dependent variables

Multiple regression analysis simultaneously evaluated the relations of individual, family, and community variables, and explained 33.8, 9.7, 13.2, 17.9, and 9.3 percent of the variance of the physical, psychological, environment, social relation, and satisfaction domain respectively (Table 5).

Table 5: Multiple regression analysis of the quality of life of the elderly (N=415)

Independent Variable	Dependent Variable (Domain of Quality of Life of the Elderly)										Summary results
	Physical		Psychological		Environment		Social relation		Satisfaction		
	Beta	t	Beta	t	Beta	t	Beta	t	Beta	t	
Individual											
1. Sex	.025	.569	-.001	-.019	.110	2.154*	-.078	-1.585	.065	1.257	S
2. Age	-.193	-4.290**	-.052	-.995	.083	1.606	.014	.274	-.010	-.198	S
3. Marital status	-.008	-.181	-.072	-1.403	-.074	-1.469	-.008	-.172	.063	1.231	NS
4. Education	-.062	-1.338	-.017	-.310	.021	.401	.077	1.499	-.047	-.862	NS
5. Income	.199	2.514*	.109	1.978*	.006	.117	.119	2.250*	-.040	-.728	S
6. Knowledge of health	.054	1.142	.129	2.345*	.101	1.857	.014	.261	.015	.274	S
7. Health practice	-.036	-.833	-.064	-1.262	.003	.060	.022	.466	.159	3.144**	S
8. Self-reliance	.311	7.233**	.057	1.140	-.020	-.410	.070	1.452	-.098	-1.944	S
9. Participation	-.078	-1.568	-.112	-1.935	.057	.996	.011	.195	.001	.016	NS
Family											
10. Type of family	.049	1.207	.044	.921	.075	1.589	.031	.669	-.062	-1.285	NS
11. Care and attention	.093	2.271*	.098	2.057*	.141	3.004**	.104	2.289*	-.023	-.483	S
12. Role taking	.123	2.761**	.088	1.685	-.104	-2.041*	.082	1.649	.027	.515*	S
13. Residential environment	-.027	-.657	-.115	-2.361*	-.069	-1.444	-.045	-.978	.112	2.304*	S
Community											
14. Activity in community	.276	5.489**	.149	2.528*	.052	.909	.242	4.324**	.077	1.307	S
15. Physical environment	.101	2.453*	0.17	.353	.264	5.579**	.200	4.347**	.107	2.210*	S
16. Information	.050	1.226	.130	2.710**	.104	2.214*	.141	3.077**	.198	4.123**	S
R	.603		.364		.406		.459		.358		-
Adjusted R square	.338		.097		.132		.179		.093		-
F	14.235**		3.788**		4.918**		6.629**		3.649**		-

Note: NS = not significant; S = significant

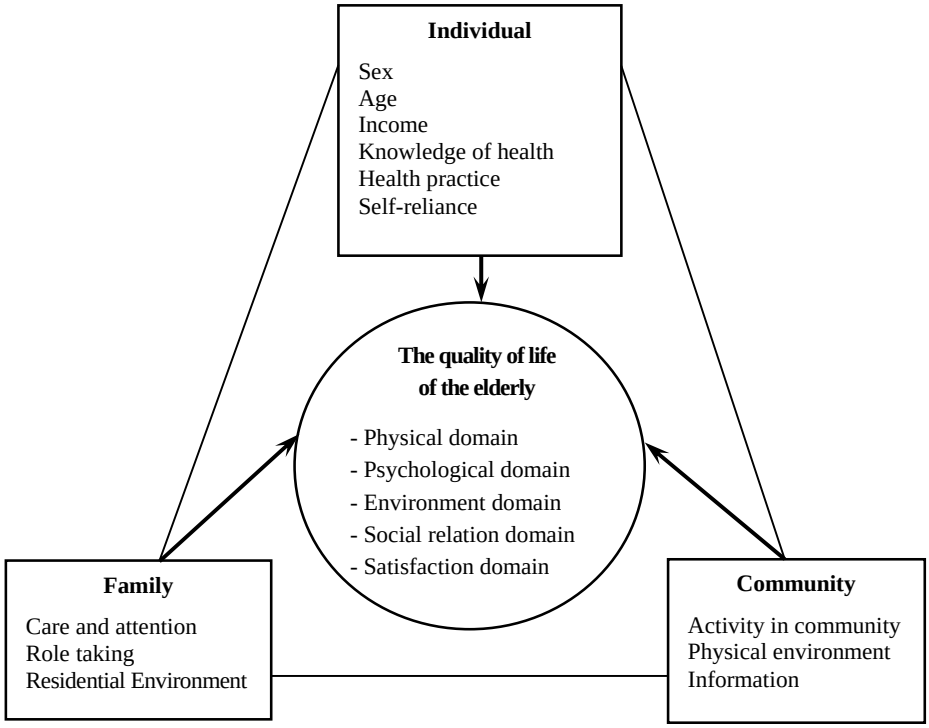
Sex, age, income, knowledge of health, health practice, self-reliance, care and attention, role taking, residential environment, activity in community, physical environment and information were all significantly related to the quality of life of the elderly ($p<0.05$). Marital status, education, participation and type of family did not significantly affect the quality of life of the elderly.

Of the individual factors, sex, age, income, knowledge of health, health practice and self-reliance were significantly associated with one or more domains of the quality of life of the elderly; of the family factors, care and attention, role taking and residential environment were significantly associated and of community factors, activity in community, physical environment and information were significantly associated with one or more domain of quality of life of the elderly.

The strongest association of individual, family and community factors was found with the physical domain of the quality of life. A graphic representation of the associations of individual, family and community factors and domains of quality of life is presented in Figure 2.

Figure 2

Summary of this research: Components of the quality of life of the elderly and factors affecting the quality of life of the elderly



Discussion

Two important conclusions can be drawn from our study of the quality of life of the elderly in Phra Nakhon Si Ayutthaya Province, Thailand. Firstly, use of the WHOQOL-BREF-THAI allows distinguishing five domains in the quality of life of the elderly: physical, psychological, environmental, social relation and satisfaction. Second, of these domains, the physical area appears to be the most important and is strongly associated with individual, family and community factors. Hence, multiple factors are open to intervention for improvement of the physical domain of the quality of life of the elderly. Our findings support the notion by Muller-Buhl et al. (2003: 36-40), that the

most important criterion for the quality of life is the physical ability or disability. Our study also shows that individual, family and community factors significantly impact other domains of the quality of life of the elderly, e.g., the psychological, environmental, social relation and satisfaction domains.

Some recommendations can be derived from our results. Before reaching the age of retirement and the elderly, the labor-force age population should be better prepared in terms of financial and human resource building. Physical self-reliance and financial independence seem to be the most important factors and policies for the elderly should therefore address these issues.

The results of this study revealed that family support was associated to better mental health of the elderly. The importance of the traditional family support system has been documented previously (Knodel and Chayovan, 1997; Zimmer and Kim, 2001; Yin, Zhou and Bashford, 2002; Shyu, 2002; McGilton, 2002). In this respect it may also be recommended for the elderly to rely more on family and play more active roles in the community. This will likely decrease dependence on the traditional family values and increase community reliance and support, as well as a venue to address and improve residential environment issues. However, as in previous studies, community participation among our respondents was low (Siriphanich, 1999). This suggests the need for a more community-based approach for improvement of quality of life for the elderly, which may be a cheaper alternative than institutional measures alone (Glavin, 2004 cited in Wongboonsin, 2004: 14-20). While Lubitz et al. (2003) have indicated that people requiring higher care may need to be institutionalized, others have argued that a future system for support of the elderly will only be successful if it is holistic and includes societal and community support (Benbo, 2002; Do-Le and Raharjo, 2002; Hellstrom, Andersson and Hallberg, 2004).

Some limitations of our study should be mentioned. The generalizability of our findings may be limited as our sample size was small and restricted to one province in Thailand. In addition, our sample did not accurately reflect the demographic composition of the population of the elderly in Phra Nakhon Si Ayutthaya Province at

large, since women were over represented. The age composition of our sample however, was rather similar to the age composition of the total population, as derived from the 2000-2005 projections (National Economic and Social Development Board, 2003:72). Moreover, our study used quantitative pre-determined instruments to assess the quality of life of the elderly, as a result of which, other dimensions that may be important such as religion, beliefs, spirituality or culture may have gone unnoticed. Clearly, more qualitative types of research are needed to further investigate and clarify areas of importance to the quality of life of the elderly. In the mean time however, we believe that the results of our study provide helpful information to inform and target interventions to improve the quality of life of the elderly.

Acknowledgements

The researchers would like to thank both the Royal Golden Jubilee Program of the Thailand Research Fund and University Development Committee for its funding and support.

References

Agresti, A., and Finlay, B. 1997. *Statistical methods for the social sciences*. 3 rd ed. New Jersey: Prentice Hall International.

Benbo, Z. 2002. "Family support for the elderly in ageing society". 2002 IUSSP Regional Population Conference Southeast Asia's Population in a Changing Asian Context Bangkok, Thailand. June 10-13, 2002. Abstracts. S23-1: 1-120.

Do-Le, K. D., and Raharjo, Y. 2002. "Community-based support for the elderly in Indonesia: The case of PUSAKA". Paper Presented at the 2002 IUSSP Regional Population Conference on Southeast Asia's Population in a Changing Asian Context Bangkok, Thailand. June 10-13.

Glavin Ye - Fan, W. 2004. "Application of evidence-based population profile for long-term care system surveillance". International Conference on the Demographic

Window the Health Aging: Socio-economic Challenges and Opportunities Beijing. May 10-11.

Hellstrom, Y., Andersson, M., and Hallberg, I. R. 2004. "Quality of life among older people in Sweden receiving help from informal and/ or formal helpers at home or in special accommodation". *Health and Social Care in the Community*, 12, 6, 504-516.

Jitapunkul, S., Kunanuson, C., Poolcharoen, V., and Suriyawongpaisan, P. 1999. *Health problem of Thai ageing*. 1st ed. Bangkok: Holistic Publishing (In Thai).

Knodel, J., Chayovan, N. 1997. "Family support and living arrangements of Thai elderly". *Asia-pacific Population Journal*, 12, 4, 51-68.

Lubitz, J., Cai, L., Kramarow, E., and Lentzner, H. 2003. "Health, life expectancy, and health care Spending among the elderly". *The New England Journal of Medicine*, 349, 1048-1055.

Mahatnirankul, S., Tuntipivatanasakul, V., Pumpisanchai, V. Wongsuvun, K., and Pronmanagirungkul, R. 1997. "Comparison of the WHOQOL-100 and the WHOQOL-BREF (26 items)". Research Report. Public Health Ministry. (In Thai).

McGilton, K. S. 2002. "Enhancing relationships between care providers and residents in long-term care". *Journal of Gerontological Nursing*, 28, 12, 13-21.

Mendenhall, W., and Sincich, T. 1996. *A second course in statistics: Regression analysis*. 5th ed. Upper Saddle River, New Jersey: Prentice-Hall.

Muller-Buhl, U., Engeser, P., Klimm, H.D., and Wiesemann, A. 2003. "Quality of life and objective disease criteria in patients with intermittent claudicating in general practice". *Family Practice*, 20, 1, 36-40.

National Economic and Social Development Board. 2003. *Population projections for Thailand 2000-2025*. (n.p.).

Norusis, M. J. 1993. *SPSS for Windows: Professional Statistics, Release 6.0. SPSS Inc*. The United States of America.

Office of the Prime Minister, National Commission on Elderly of Thailand. 2002. *The second national plan for older person (2002-2021).* Bangkok: Kuruspa Lad Phroa. (in Thai).

Paluangrit, S. 1997. "Development of the Health Care Model : A Study on Health Care for Elder and Disable Groups by Elder Peer at Village level, Amphur Bangsai, Changwat Pranakornsriayutthaya". Research Report. Thammasat University. (In Thai).

Shyu, Yea-Ing L. 2002. "A conceptual framework for understanding the process of family caregiving to frail elders in Taiwan". *Research in Nursing and Health*, 25, 111-121.

Siriphanich, B. 1999. *Ageing in Thailand*. Bangkok: Mohchaban Publishing Home. (In Thai).

The World Health Organization, Division of Mental Health. “Field Trial: WHOQOL-100”. February 1995. [Online]. Available from: http://www.who.int/ evidence/ assessment-instruments/qol/ql5.htm [Accessed 2005 August 18].

The World Health Organization, Division of Mental Health. “WHOQOL-BREF”. 1996. [Online]. Available from: http://www.who.int/evidence/assessment-instruments/qol/ documents/WHOQOL_BREF.pdf [Accessed 2005 August 18].

Wongboonsin, K. 2004. "The elderly: Challenge problem", Paper presented at the conference on “The elderly: Knowledge base resources”, organized by Bureau of Empowerment for Older Person, Ministry of Social Development and Human Security and The Thai Society of Gerontology and Geriatric Medicine, August 4-6, 2004, at the Convention Center Chulabhorn Research Institute, Bangkok, Thailand. (In Thai).

Wongboonsin, K., and Wongboonsin, P. 2004. "Modern population trends and the family". Presented at the Asia Pacific Family Dialogue, Kula Lumpur, October 11-13.

Wongboonsin, K., Guest, P., and Prachuabmoh, V. 2004. "Demographic change and the demographic dividend in Thailand". Presented at the International Conference on

the Demographic Window and Healthy Aging: Socio-economic Challenges and Opportunities, Beijing, May 10-11.

Yin T., Zhou Q., and Bashford, C. 2002. "Burden on family members: Caring for frail elderly: A Meta-Analysis of interventions". *Nursing Research*, 51, 3 (May/June), 199-208.

Zimmer, Z., and Kim, S. K. 2001. "Living arrangements and socio-demographic condition of older adults in Cambodia". *Journal of Cross-cultural Gerontology*, 16, 4, 353-381. Kluwer Academic Publishers.

Appendix

WHOQOL-BREF-THAI

Questions	not at all	a little	moderately	mostly	completely
1. How satisfied are you with your health?					
2. To what extent do you feel that physical pain prevents you from doing what you need to do?					
3. Do you have enough energy for everyday life?					
4. How satisfied are you with your sleep?					
5. How much do you enjoy life?					
6. How well are you able to concentrate?					
7. How satisfied are you with yourself?					
8. Are you able to accept your bodily appearance?					
9. How often do you have negative feeling, such as blue mood, despair, anxiety, depression?					
10. How satisfied are you with your ability to perform your daily living activities?					
11. How much do you need any medical treatment to function in your daily life?					
12. How satisfied are you with your capacity for work?					
13. How satisfied are you with your personal relationships?					
14. How satisfied are you with the support you get from your friend?					
15. How safe do you feel in your daily life?					
16. How satisfied are you with the conditions of your living place?					
17. Have you enough money to meet your needs?					
18. How satisfied are you with your access to health services?					
19. How available to you is the information that you need in your day-to-day life?					
20. To what extent do you have the opportunity for leisure activities?					
21. How health is your physical environment?					
22. How satisfied are you with your transport?					
23. To what extent do you feel your life to be meaningful?					
24. How well are you able to get around?					
25. How satisfied are you with your sex life?					
26. How would you rate your quality of life?					