

The Vulnerability Perception of Urban Elder in Khon Kaen, Thailand

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Abstract: This research aimed to examine the perceived vulnerability of urban elder in Thailand. The study was conducted using the qualitative approach. The target group was 15 elders who live in the urban area in Khon Kaen Province, Thailand. Those were purposely selected using a variety of elder characteristics including gender, age, education and health status. Data was collected by in-depth interviews with interview guideline and non-participatory observation during February to April 2014. Content analysis was employed for data analysis. Descriptive analytic methods were used for result presentation. Results showed that the urban elders' perceived vulnerability differently in accordance with their perception and experiences which could be classified into 3 groups. First, a non-vulnerable group consists of 2 types of characteristics: absence of experienced chronic illnesses and chronic illnesses experienced without symptoms. The elders in this group could do their Activities of Daily Living (ADL) household chores, social activities and also occupation activities. Second, mild-vulnerability group are the elderly who live with at least one chronic disease. They need help doing outside activities but are still independent on ADLs and household activities. The last group was severely vulnerable. These elders experience severe chronic illness conditions which make them weak and lead to worse health. They can do some ADLs but can not do household chores and outside activities. This study proved that although, older persons are placed in the vulnerable group, there are three categories of vulnerability.

Key words: Vulnerability, elderly, chronic disease, perception, health

INTRODUCTION

Aging is a process which happens to every human being. This process makes people face health problem because of organ deterioration such as low attentiveness, loss of sensory refinement, slow response to stimuli and bone fragility. In addition, old age is the period of suffering from chronic illness such as hypertension, diabetes melitus and cardiovascular disease (NSO, 2008). Moreover, the older people are confronted with mental health problems more than other age groups. The impact of physical and mental stress by health problems affects to their lives. The older persons are called vulnerabe group by those conditions.

Although, the elderly are defined as a vulnerabe group, some of them are still active in family and social activities in a family member role. They engage in household activities such as cooking, house cleaning and also take the role of caretaker for grandchildren (Hornboonherm *et al.*, 2009). Moreover, some older people are still active working to earn income (38.6%). The occupation of the elderly varies in careers like agriculture

(65.6%), service and commerce (25.0%) and production (NSO, 2012). The aforementioned survey shows increasing numbers of the elderly who work regularly to earn income and sustain their families economic status. They are also independent and can be supporter (Soonthornhdada, 2001). In addition, the elders who have experience or professional expertise can join in the project of Brain Bank as senior volunteers who compose of expert disciplines with 4,238 members (NESDB, 2014).

The phenomena addressed above reflect the varying roles of people of old age. Although, the elderly are defined as the vulnerability group, some elderly people can join in many activities similar to people of adult age in both living independently and supporting their families. Then not all elderly are vulnerability people in researcher's opinion. Vulnerability should be defined in another way by the elderly themselves. Because of different experiences, the aging people will perceive themselves in different ways and meanings. For healthy elderly would perceive themselves differently from dependent elderly because they can work continuously

be strong and live independently. This research was design to study vulnerability perception of urban elderly essential for supporting the argument in this issue. The research is congruent with owners and useful for policy making to distribute appropriate and corresponding support for existing vulnerability of the elders.

Research objective: To examine the vulnerability perception of urban elders in Thailand.

Research framework: The study of vulnerability perception of the elderly was based on 2 concepts:

- Phenomenology
- Activity theory

Phenomenology, the concept created by Edmund Husserl and is the idea which focuses on understanding the truth that people perceive along with their experiences or perceptions in the real world. Real experiences of human beings is the main point that researcher is interested in to study in varies social contexts (Creswell, 1998). Activity theory explains the activities engaged in by elderly. Activities are classified into 3 types:

- Informal activity is a general activity such as shared activities with family, friends and neighbors
- Formal activities are social activities that older person share with social institutes such as volunteers
- Solitary activities are activities which elderly do in isolation which include watching television, walking, etc.

Life satisfaction of the elderly stems from the ability to maintain and do activities continuously (Crandall, 1991).

Researcher applied 2 concepts to build up the conceptual framework to study vulnerability perception of the elderly. Elderly experience was the crucial point to create understanding about perception on vulnerability among the elderly.

MATERIALS AND METHODS

This study of vulnerability perception of the elderly was qualitative research. The research targets were the highest proportion of elders (18.15%) in the municipal community, Muang District, Khon Kaen Province.

The key informants consisted of three groups. The first group composed of 10 community key informants such as the community leader, the former community

leader, the community health volunteer, the public health community officers, a monk and the community committees. The second group was 7 family key informants such as older persons spouses, children and grandchildren. The last group was 15 older people. Researcher collected data by using in-depth interviews and non-participatory observation with guidelines.

The data was collected for 3 months between February and April, 2014. The data was selected from the elder's experiences especially the actions that reflected vulnerability were analyzed by applying content analysis. In the process of analysis, researcher interpreted the perceptions of vulnerability of the elderly.

RESULTS AND DISCUSSION

Three parts of research results are presented:

- Contexts of community and elderly families
- Demographics of the population, social and economic information on the elderly
- Vulnerability perceptions of the elderly

Context of the community and elderly families: Muangthong community (fictitious name) is a municipal community located at the intersection of two super high ways, the first is straight to the North region and the second connects the Lao PDR border. This community is one of ninety communities which are under the development plan of Khon Kaen municipality, Muang District, Khon Kaen Province. The majority of this community area is used to construct residences and stores. From exploratory observation, researcher finds a variety of elderly residences depending on economic status. Most houses are detached house with ceramic roofs.

The proportion of elderly in this community is higher than the national average. Most of them are of Thai-Lao ethnic groups. The 18% are older persons who have good relationship with others which is reflected in the sharing of care during acute and chronic health problem. A male aged 74 reported that his neighbors took care of him while he was exhausted and felt numb in both legs 2 years ago. Neighbors called his son to take him to the hospital because he could not walk. Another case is a female elderly aged 68 years old. She receives help regularly from the neighbors. She stated, "When I have to get medicine at the hospital they take me there and help me all I ask for".

Almost all people in this community are Buddhist. Therefore, the people engage in traditional religious activities at the temple, although, they have to walk

around 2 km. A monk said, "The older people come to the temple regularly with their children and grandchildren on the important days of Buddhism". Religious activities joining with family member and other people reflected strong relationship between elderly and family and community and also reflected the elderly physical competency for social interaction outside their residences.

About there is state welfare for the older persons in community, nine eighteenth of village health volunteers take responsibility to work with health professionals in health promotion projects for the elderly supported by Khon Kaen municipal such as "The caring and concerning of the elderly project" which was implemented to educate the elderly about self-caring; "The project of chronic illness care in community" which implemented activities of health education about changing behaviors and home visits for mental health support. The last project is called "Visiting disabled in the community" which purposed to give material support for the elderly in the form of towels, face towels, soap, detergent, toothpaste and electric fans.

Another kind of welfare for pensioners is financial aid, retirement pensions and universal health coverage projects. The older people who receive retirement pensions would not get support from the two other projects. About the financial aids, the older pension would receive it in form of progressive payment. This means that they receive more money along with progression of age, the older they are, the more they receive. The payments are as follows: 600 baht for age between 60 and 69 years old, 700 baht for aged between 70 and 79 years old, 800 baht for age between 80 and 89 years old and 1,000 baht for aged 90 year old and over.

Families of the elderly: The living arrangements of the elderly vary in 3 patterns such as living with children (2 generations), living with children and grandchildren (3 generations) and living with spouses (1 generation). Seven elderly live in 2 generation families with their children while 5 elderly live in 3 generation families and 3 elderly live in 1 generation families. The elderly felt that they have strong relationship with their family members especially in families of 2 or 3 generations. Living with children both children and grand children increases the opportunity of face to face contact between the elderly and grandchildren or children. A female aged 68 years old reported about phone calls with her grandchild "my grandchild calls me frequently. She asks me, "Have you had lunch yet?" "What are you doing grandmom?" Other

interactions between elderly and their children who live closely are supportive such as taking care of them when they sick or are uncomfortable. A female elderly aged 89 years old said, "I walk to ask my first son to buy me some medicine and call my second son to take me to the hospital in the evening." During their admission in the hospital, the older people receive help and care from their children and grandchildren. The same female elderly said, "I was admitted in the hospital for 3 days. My niece was with me". Daily interaction between elderly and younger generation reflected that family member especially children and grandchildren are the main caregiver for the elderly, although, it is an urban area.

The contexts of family and community that the research addressed above showed the relationship of geographic, economic and society features and elderly activities and also reflected family relations in the pattern of support from younger generations to the older persons. Recognition of all relationships in daily living of elderly could help the research to make correct understand about experiences and vulnerability perception of elderly in all dimension.

Population economics and social demographics of elderly: Fifteen targets in this research composed of 7 male and 8 female elderly. The targets aged between 60 and 69 years old (young aging) were 5 persons, aged between 70 and 79 years old (middle aging) were 7 persons and aged 80 year old and above (late aging) were 3 persons. The 7 elderly are married and lived together with spoused, another 7 persons are widowed and the remaining person is separated.

The >50% of elderly finished primary school (8 persons). The others education levels were followed: bachelor degree (2 persons), secondary school (3 persons) and professional diploma (2 persons). The >80% (13 persons) live with chronic illness conditions. Hypertension is the most chronic illness that 13 older persons suffer from. Diabetes mellitus is found in 3 persons, vascular and renal diseases are found in 2 persons and other diseases are asthma, gouth, osteoporosis which are found in 1 person.

The majority of elderly in this study are not unemployed (10 persons) with 5 persons still working for income, 2 persons have dormitories for rent, other two work as technicians and the last one makes folded bags from nonused paper. Incomes range between 1,500-5,000 baths per month (48-242 USD). Almost 50% of the elderly receive money from their children; around 2,500-5,000 baht per month (81-161 USD). Moreover, three persons receive retirement money; about 12,000-28,000 baht per month (387-903 USD). Other sources of income are financial aids

for elderly and salaries for village health volunteers who receive around 600-800 baht per month (19-26 USD). Incomes of the elderly reflect economics status and competency of some older people who are still active workers. For family support, the elderly still receive economic support from their younger generations.

Vulnerability perception: Vulnerability perception of the elderly which focus on experience and vulnerability of fifteen older persons are divided into 3 groups:

- Non-vulnerability group
- Mild vulnerability group
- Severe vulnerability group

Non-vulnerability group: The elderly in this group are divided into 2 subgroups:

- Experience chronic illness without symptoms
- Non-experience of chronic illness subgroups

Two elderly experience no illness perceive themselves as non-vulnerable because they are healthy and can do all Activities in their Daily Living (ADL) such as household chores, social activities and also occupation activities.

Mr. Won (fictitious name) a male aged 62 is a healthy person who lives with 3 generations and 4 family members; his father aged 91 years old, mother aged 80 years old, himself and his niece aged 31 years old. Mr. Won is still active in all activities including ADLs his career, household chores, taking care of his older parents, shopping and joining community activities with his mother.

Mrs. Malee (fictitious name) a female who lives with her adult son aged 57 years old and grandson aged 16 years old. Mrs. Malee is a healthy elder who has never faced health problem or illness. Mrs. Malee said, I have no health problems. I can do activities in daily living myself. I help to do household chores such as cleaning the house "My son asks to do nothing but I can not. I tell him that I am strong". Other activities which Mrs. Malee can do outside the family home are shopping for preparation of food for monks next morning.

The elderly in this group can live normally and regularly similar to other people who are normal because they are healthy and capable to do all activities they need. Their living conditions make them perceive that they are not vulnerable persons they concluded that: "My health is normal. I could go and do as I need. I have no problems about money so I think I am not vulnerable".

For the elderly who experience chronic illness without symptoms perceive themselves as not vulnerable. There are

6 persons; 2 male and 4 female. Five sixth of the people have one chronic illness which is hypertension while 1 person suffers from 2 diseases which are hypertension and gout. Although, they live with chronic illnesses it is not obvious or has severe symptoms which make them dependent on others help. They are still healthy, strong physically and able of doing activities of daily living and other activities themselves. Mrs. Duangjun (fictitious name) a female aged 71 years old told about her chronic illness without impact on daily living "It is not different sick or not. It does not affect my life. It just takes medicine and follows the doctor's orders".

The competencies of the elderly in this group reflect their activities in daily living. They are able to take care of themselves and do activities similar to the previous subgroup such as housework, washing dishes, cleaning and cooking. Mr. Duangjun said, "I am not tired so I keep doing housework such as cooking and cleaning the house. I try to do everything I can. I need to help".

Another activity that the elderly engage in to support their family is taking care of grandchildren. Mrs. Seeda (fictitious name) a female aged 77 year old, stated, "I help my child to take care of my grandson. After he comes back from school, I prepare food and some kinds of sweets for him until his parents come back home late in the evening".

By observation, research found that the elderly in this group are able to participate in community activities. A female aged 64 years old can drive a motorcycle to join any activities in community as well as caring and concerning after elderly and participating in the project of Ram-Wong Yon Yook (the old era comeback dance). One male aged 70 years old who lives with hypertension can drive a pick-up truck to join meetings outside the community.

The experience of the elderly, addressed above point out that chronic illness without symptoms are not barriers to engaging in activities for older persons. All elder could do many activities; they need inclusion in ADLs, housework, caring of grandchildren and outside activities in the community. These elderly perceive that they are not vulnerable persons. One female aged 64 years old stated, "If I am not a burden to my children and grandchildren, I am not a vulnerable person. I have not been vulnerable". The perceptions of elderly show that although, they face chronic illnesses they confirm that they are not vulnerable persons.

Mild-vulnerability group: There are 6 older persons in this group which compose of female and male in equal proportions. All of them experience chronic illnesses and do not have a strong health. They can do only ADLs and have limitations to do other activities such as

household chores, going outside their house even in the community. The elderly live with at least one chronic illness. The highest number of diseases is three.

The chronic illnesses found among elderly are hypertension, diabetes mellitus, vascular stenosis and osteoporosis. All elderly had experienced being patients admitted in the hospital. After a few days and nights of admission, their healths are not completely rehabilitated. They suffer from abnormal walk and loss of memory. Mrs. Yoma (Fictitious name) a female aged 72 stated, "When I went into shock, I had a blood sugar of 800. They call to transfer me to the hospital. I woke up and was conscious after 4 days of admission and I could remember nothing." Mr. Somchai (Fictitious name) a male aged 73 years old, told the research about his illness of cerebrovascular occlusion and physiotherapy: "...I wake up and could not walk. They called for physiotherapy".

The impact of severe illness is that the elders health is not as strong compare with the past. They lack confidence in doing activities outside residences such as going to the hospital, crossing the street and going to the temple to perform religious activities. The elderly need help from spouses, children and grandchildren.

Mr. Somchai described his dependence on his wife, "I do not ask my child to take me to the hospital because he is busy with his job so it is my wife who goes with me to see the doctor. ...In the early stage of my illness I went to the hospital every month but now every three months".

Mrs. Yoma talked about the effects of illness which make her less confident to go to the hospital herself. "After I woke up from getting sick, I could not cross the street so I asked my daughter to take me to the hospital". However, although, they need help from others for outside activities they can do ADLs themselves. They can also help their children with some household activities such as washing dishes, glasses, bottles, etc.

The experience of getting sick from chronic illness and the effects of after wake up from severe conditions in the hospital make them lose confidence and increase dependence on others. This reduces their ability to join outside activities and make them perceive themselves as vulnerable. Mrs. Wipa (Fictitious name) a female aged 68 years old described activities which make her dependent on her son and vulnerable: "I am vulnerable... I can not go outside myself. I always depend on my son". Mr. Somchai shared his vulnerability perception by talking about his dependent activities. He said that his wife takes him to the hospital, "I have to be vulnerable because I do not do the same as in the past, I can not drive. ... my wife has to take me to the hospital".

Severe-vulnerability group: Only one older person in this research has experiences of severe chronic illness conditions which make him weak and have worsened health. He can do some ADLs but can not do household chores. Mr. Boonsom (Fictitious name) a male aged 68 years old, lives together with his wife, he got sick from three chronic diseases including hypertension, diabetes mellitus and renal disease. He experiences hemodialysis at the hospital. For now, he has to receive continual treatment by abdominal dialysis at home. His wife administers that treatment 4 times a day. Mr. Boonsom can not do housework or outside activities because of his bad health and weakness. Boonsom's wife said about limitation and suffering of her husband, "He has stopped using the mobile phone 5-6 years ago. Now, he could not go anywhere or do activities by himself. He is in a very difficult situation as a disabled person...". However, Mr. Boonsom can do some ADLs under close care of his wife such as moving from the bed, dressing himself and eating. He needs help from his wife to take a bath and go to the toilet. From observations researcher found that Mr. Boonsom usually lies down on the bed without ambulation except during wife's abdominal dialysis, going to the toilet and eating. Mr. Boonsom expressed his feeling about his illness, "It is very difficult to walk, stand and eat. My wife has to prepare everything and takes care of everything. It's suffered lot of suffering. I have nothing to say".

The result of chronic illness experienced by Mr. Boonsom indicated the effects of severe chronic illnesses of the elderly which makes him be a disabled person who completely depends on his wife for almost all activities. His ADLs, housework and outside activity are his wife's burden. We can say that this older person is very severely vulnerable. Mr. Boonsom compares his health and perceived vulnerability to broken eggs. He expressed, "Symptoms are worse without rehabilitation, I can not control my lips to speak well, I get exhausted, cannot write and I can do nothing, like broken eggs."

These study results on perceived vulnerability in elderly in urban areas in Thailand prove that although, older persons are classified into the group of vulnerability there are three levels of vulnerability including non-vulnerability, mild-vulnerability and severe vulnerability (Table 1).

This research is available to realize vulnerability perceptions of the elderly which correspond to phenomena's owner perspectives. There are 4 issues need to discuss: aging lead to chronic illness experiences, elderly perceive of vulnerability in different ways, ability to do activities oneself be a crucial condition of vulnerability perception and severity of illness related to vulnerability.

Table 1: Experience, ability to do activities, perceived vulnerability of the elderly

Experiences	Ability to do activity							Vulnerability perception
	ADLs		Housework		Outside activities			
	Independent	Need help	Independent	Unable	Independent	Need help	Unable	
Without chronic illness	✓	-	✓	-	✓	-	-	None
Chronic illness without symptoms	✓	-	✓	-	✓	-	-	None
Chronic illness with mild symptoms	✓	-	✓	-	-	✓	-	Mild
Chronic illness with severe symptoms	-	✓	-	✓	-	-	✓	Severe

The first issue is aging leads to chronic illness. The research results found that thirteen fifteenth of the targets experience chronic illness such as hypertension, diabetes mellitus and renal disease. This finding can be explained by biological theories of aging (Hooyman and Kiyak, 1999) which state that aging results from changing cell structures, the immune system and organs. Consequences of that change lead to chronic illnesses including cardiovascular disease, diabetes mellitus and renal disease.

The second issue is elderly perceive vulnerability in different ways. These research findings reveal that the elderly perceive vulnerability differently on 3 levels:

- Non-vulnerability
- Mild-vulnerability
- Severe-vulnerability

These patterns of vulnerability are similar to vulnerability levels in many previous contexts such as vulnerability as a risk factor, possible confrontation with dangerous situations (Birkmann, 2007). In the context of residence, the farther away elderly live from downtown, the more vulnerable they are. Aging is divided into 2 group such as the group of the chronically ill and the people unable to do ADLs and groups of most disabled who need to access public services and need help from public aid (Prasartkul *et al.*, 2012).

The third issue is the ability to do activities oneself. It is a crucial condition of vulnerability perception. In general, having of two chronic illnesses and over are used as health indicator of the elderly (Hermalin and Ofstedal, 2003) and are identified as having a negative effect on ability to do ADLs of the elderly (Moser *et al.*, 2011). However, this research results found that although a male aged 70 years old has two chronic illnesses; hypertension and gout, he perceives himself as non-vulnerable because he can do all activities he requires. That finding was explained in a view of ability to do activity, so only the number of chronic illnesses which the elderly have can not be the only condition of vulnerability perception. It is congruent with the vulnerability framework of Schroder-Butterfill and Marianti (2006) who indicate the relationship between coping capacity and bad outcomes. In this framework, the persons who can face threatening situations, bad outcomes do not happen. Similarly, the

elderly who are threatened by chronic illness without affects on ability to do activity and do all activities themselves perceive that they are not vulnerable. Then, ability to do activity is a crucial condition of vulnerability perception.

The last issue is severeness of illness related to vulnerability. This research found that two elderly who face 3 chronic illnesses perceived vulnerability differently. The male elder perceived that he was very vulnerable because of coping with severe chronic renal disease which affects his health very much. He can do some ADLs under close attention from his spouse. For example, taking bath and going to the toilet. He can not join outside activities. Another female elder who lived with chronic illness including hypertension, diabetes mellitus and osteoporosis perceived that she was mildly vulnerable because she can do all activities involved in ADLs, housework with some help and outside activities. This finding showed that severeness of illness causes different perception of vulnerability in the elder, although, they have an equal of three chronic illnesses.

CONCLUSION

These research results showed that the elders who are placed in the same group of vulnerability have their own perception of vulnerability which are different and classified to 3 levels. These groups are non-vulnerability, mild-vulnerability and severe-vulnerability. The level of vulnerability depends on having a chronic illness, the severeness and ability to do activities by themselves. The first group is elders who perceive that they are not vulnerable and it composes of two subgroups of chronic illness conditions: a group without chronic illness and A group of people living with chronic illness without symptoms. All elderly in this group can do ADLs, housework and outside activities by themselves. The second group is the elder who perceive that they are mildly vulnerable. On the topic of chronic illness conditions, there are elderly who experienced severe symptoms leading them to be hospitalized and unable to rehabilitate to the same state of health as before. They can do ADLs and household chores by themselves but for outside activity they need some help. The last group is the elderly who perceive that they are very vulnerable. This group has bad experiences with chronic illness which

affect the ability to do ADLs alone. This person has to receive close care from a spouse almost all the time. The phenomena in this research reveal that vulnerability perception of the elderly depends on experience of chronic illness and it's affected by the ability to do activities.

RECOMMENDATIONS

Research results point out that vulnerability perception of the elder are different depending on experience of chronic illness and its effects on ability to do activities. These were divided into three groups: non-vulnerability mild-vulnerability and severe-vulnerability. The national policy and strategy about welfare for elderly should concern with different levels of vulnerability corresponding to elderly experiences of chronic illness and their ability to do activities.

Moreover, the research findings reveal that family members especially spouses and adult children are the key persons who take care of the elderly with perception of mild and severe vulnerability. Then, all caregivers of vulnerable elderly should be trained to give quality care which is transferred to these elderly.

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REFERENCES

Birkmann, J., 2007. Risk and vulnerability indicators at different scales: Applicability, usefulness and policy implications. *Environ. Hazards*, 7: 20-31.

- Crandall, R.C., 1991. *Gerontology: A Behavioral Science Approach*. 2nd Edn., McGraw-Hill, New York, USA., ISBN-13: 978-0070134461, Pages: 618.
- Creswell, J.W., 1998. *Qualitative Inquiry and Research Design: Choosing among Five Traditions*. Sage Publications, Thousand Oaks, CA., USA., ISBN-13: 9780761901433, Pages: 403.
- Hermalin, A.I. and M.B. Ofstedal, 2003. Identifying the vulnerable elderly in Asia and their level of disadvantages. *Proceedings of the Annual Meeting of the Population Association of America*, May 9-11, 2002, Atlanta, GA., USA.
- Hooyman, N.R. and H.A. Kiyak, 1999. *Social Gerontology: A Multidisciplinary Perspective*. 5th Edn., Allyn and Bacon, USA., ISBN-13: 9780205277728, Pages: 542.
- Hornboonherm, P., P. Kamnuansilpa, S. Wongtanavas and T.D. Fuller, 2009. Intergenerational relationship and well-being of grandparents in Northeast Thailand. *J. Popul. Social Stud.*, 17: 1-24.
- Moser, C., J. Spagnoli and B. Santos-Eggimann, 2011. Self-perception of aging and vulnerability to adverse outcomes at the age of 65-70 years. *J. Gerontol. Ser. B: Psychol. Sci. Social Sci.*, 66: 675-680.
- NESDB., 2014. [Name list of expert volunteer]. Office of the National Economic and Social Development Board (NESDB), Bangkok, Thailand (In Thai).
- NSO., 2008. [Summary of key functions of the elderly in Thailand 2011]. Statistical Forecasting Bureau Office, National Statistical Office, Bangkok, Thailand (In Thai).
- NSO., 2012. [Population and housing census 2013]. National Statistical Office, Bangkok, Thailand (In Thai).
- Prasartkul, P., S. Chuanwan and K. Thienlai, 2012. [Elderly: Insiders to were pushed to the Marginalisation]. http://www2.ipsr.mahidol.ac.th/ConferenceVIII/Download/Article_Files/5-Elderly-Pramote.pdf (In Thai).
- Schroder-Butterfill, E. and R. Marianti, 2006. A framework for understanding old-age vulnerabilities. *Ageing Soc.*, 26: 9-35.
- Soonthornhada, K., 2001. [Value of Elderly in Economic Dimension]. In: [Population and Social 2011: Value of the Elderly in the View of Thai Society], Thaweessit, S. and S. Boonmanon (Eds.). Population and Society Publishing, Nakhon Pathom, Thailand (In Thai).