Determinants of Healthcare Utilisation among the Elderly in Malaysia

Noor'ain Mohamad Yunus[a], Noor Hazilah Abd Manaf[b], Azura Omar[b], Nurita Juhdib[b], Mohd Azahadi Omar[c], Mohmad Salleh[d]

Abstract: *Population ageing is pervasive, a global phenomenon and has implications for society and the nation. Among them is demand for greater allocation of financial resources for healthcare services to cope with this demographic trend. Therefore, this study was aimed at investigating the determinants of utilisation of healthcare services among the elderly in Malaysia. A questionnaire survey was conducted among those aged 60 in 14 public hospitals in Peninsular Malaysia. Findings revealed that age, education level, income level and need for care were associated with healthcare utilisation. Thus, this study contributed to a greater understanding of the determinants of healthcare utilisation among the elderly in Malaysia. Understanding these associations may help healthcare providers and policy makers design strategies to enhance the quality of healthcare services for the elderly.*

1. Introduction

Population ageing is one of the most important demographic trend in the 21st century. This is a global phenomenon as the proportion of elderly population relative to the younger generation increases. In Malaysia, the elderly is defined as those who are 60 years old and above, the cut-off age adopted by the United Nations (UN). The elderly account for 2.83 million (9.13 per cent)

[a] Corresponding Author. Faculty of Business Management, Universiti Teknologi MARA, Puncak Alam Campus, 42300, Bandar Puncak Alam, Malaysia. *Email*: *noorainyunus@puncakalam.uitm.edu.my*
[b] Kulliyyah of Economics of Management, International Islamic University Malaysia, 53100 Kuala Lumpur, Malaysia.
[c] Institute of Public Health, National Institute of Health, Ministry of Health, 62590 Putrajaya, Malaysia.
[d] Department of Family Health Development, Ministry of Health, 62590 Putrajaya, Malaysia.

of Malaysia's total population of 31 million (Department of Statistics, Malaysia, 2015). The country is forecast to be an ageing nation by 2030 when 15% of the population is categorised as elderly. As the percentage of the elderly in Malaysia continues to increase, extensive and up-to-date information concerning this population is vital to plan for their effective healthcare strategies (Wan Ahmad & Ismail, 2014).

Over the years, Malaysia has developed an enviable healthcare system. The World Health Organisation (WHO) and United Nation has commended Malaysia for its remarkable achievement and often referred to it as a model for other developing countries to emulate in healthcare delivery. Malaysians receive high quality and equitable public healthcare service, which is delivered almost free at the point of use. Healthcare strategies adopted by the country since its independence has been successful in raising the nation's health status. As a result of good healthcare system in the country, Malaysians are living longer as their life expectancy increases. Malaysia's life expectancy had increased by 20 years over the last six decades, from 54.3 years in 1957 to 74.75 years in 2016 (Department of Statistics, Malaysia, 2015).

As population ageing is inevitable in the country, it will pose a major challenge to the Malaysian healthcare system if the latter if not planned carefully (Ambigga et al., 2011) with implication for economic and social development. Thus, ageing is a matter of great concern for the healthcare sector as population ageing will lead to an increase in demand for healthcare and social support, which may consume a large portion of funds allocated for healthcare services (Rechel & Doyle, 2009).

Given the escalation of healthcare costs for the elderly, population ageing is becoming a serious concern for both policy makers and researchers. However, research on healthcare utilisation among the elderly is limited in Malaysia (Krishnaswamy et al., 2009; Kefeli & Zaidi, 2013) and this study attempts to fill the gap in the literature. In light of this scenario, the present study investigates the determinants of healthcare utilisation among the elderly in Malaysia. In particular, factors influencing the utilisation of healthcare services are examined in line with the government's agenda in promoting positive ageing as outlined in the 11th Malaysia Plan.

1.1   Health Issues of the Elderly in Malaysia

The 4th National Health and Morbidity Survey (NHMS IV) showed that chronic non-communicable diseases, namely hypertension, type 2 diabetes, chronic heart diseases and stroke commonly affect the Malaysian elderly. In addition, orthopaedic diseases and functional impairment that restrict daily activities are more prevalent among the elderly (Institute of Public Health, 2011a). Apart from physical health, psychological health problems are also

rampant among the elderly in Malaysia (Mohd Sidik, Zulkefli, Afiah, & Mustaqim, 2003; Institute of Public Health, 2011b; Rashid, Azizah & Rohana, 2012). The most common mental disorders affecting this age group are dementia and depression (WHO, 2013).

Previous studies have reported an increasing rate of health care utilisation by senior citizens globally (Bowling, Farquhar & Browne, 1991; Andersen, Davidson & Ganz, 1994; Afilalo et al., 2004; Thode, Bergmann, Kamtsiuris, & Kurth, 2005; Nabalamba & Millar, 2007; Chen, Kazanjian, & Wong, 2008; Nie, Wang, Tracy, Moineddin & Upshur, 2008; Blackwell, Martinez, Gentleman, Sanmartin & Berthelot, 2009; Dhingra, Zack, Strine, Pearson & Balluz, 2010; Hammond, Matthews & Corbie-Smith, 2010; Surood & Lai, 2010; González-González et al., 2011; Hochhausen, Le & Perry, 2011; Schäfer et al., 2012; Liu, 2014; Institute of Public Health Malaysia, 2015).

As of December 2014, almost 75% of the elderly in Malaysia had registered themselves with public primary healthcare facilities and had undergone health screenings and interventions for physical health, cognitive function as well as other mental health conditions. An average outpatient visit to a physician by the elderly is 6.1 a year. Additionally, the elderly has more hospital admissions (157 admission per 1,000 compared with 86 admissions per 1,000 population) and a longer length of stay (Institute for Health Systems Research & Institute for Health Policy, 2013; Institute of Public Health, 2011; Krishnaswamy et al., 2009). Moreover, the elderly access public healthcare more often than private healthcare services with 83% of admissions in public hospitals, and 67% outpatient visits to public facilities (Institute for Health Systems Research & Institute for Health Policy, 2013).

Literature review suggests that the Malaysian elderly have complicated healthcare needs requiring comprehensive care (Ambigga et al., 2011; Selvaratnam, Abu Bakar & Idris, 2012; Wan Ahmad & Ismail, 2014). It is necessary to provide older people with the same access to preventive care and rehabilitation but Malaysia is still unequipped to cater for the needs of its ageing population (Teng, 2015) in which currently there are only 23 geriatricians available throughout the country - 10 in the Ministry of Health, six in academia and seven in private hospitals ("Geriatricians in Malaysia - Malaysia Society Geriatric Medicine," 2014).

As Malaysia experiences demographic changes, there will be a higher demand for consultations and hospital admissions by the elderly. Therefore, healthcare professionals have to be equipped with the skills to assess and manage the elderly. Geriatric treatment and care need to be firmly embedded in medical, nursing, and other allied sciences programmes (Ambigga et al., 2011; Poi, Forsyth & Chan, 2004; United Nations, 2002) which is critical in the deployment of multidisciplinary team-based care for the elderly (Ambigga et al., 2011).

This article has six main sections. Section one is the background of the study and describes healthcare issues faced by the elderly in Malaysia. Section two is literature review on the determinants of healthcare utilisation from an empirical perspective. Section three discusses research methodology while section four presents main findings and compares them with the research objectives. Section five consists of in depth discussion on the findings. The findings of the present study are discussed with reference to relevant published findings. Finally, the last section of this article highlights contributions and implications of the study.

2.   Literature Review

The concept of healthcare utilisation has been extensively studied (Andersen & Newman, 2005; Fernández-Olano et al., 2006; Krishnaswamy et al., 2009; Lee, Tsai, Tsai & Kuo, 2010; Saeed, Oduro, Ebenezer & Zhao, 2012; Snih et al., 2006). It is estimated that the occurrence of disability rises with age and that more than 46% of people aged 60 years and above have some kind of disability. Furthermore, increasing age is also related to higher morbidity, higher use of health services and greater demand for specialised services (WHO, 2012; Crimmins, 2010). Healthcare utilisation refers to the extent of an individual having contact with any recognised medical or health facility that is manned by qualified or trained medical practitioners. This is in agreement with the definition provided by others who define healthcare utilisation as the process of seeking professional healthcare and submitting oneself to the application of regular health services, with the purpose to prevent or treat health problems (Gamme & Morin, 2009).

It is crucial for healthcare service providers to understand the importance of healthcare utilisation in order to identify the issues that hamper the effective use of healthcare services. Moreover, it is important for health managers to determine the factors influencing healthcare utilisation. Recognising who will utilise which services and when these services will be used, can help organisations target the right consumer. More importantly, this information can benefit managers to identify new customers, spot concerns of clients who reject health services, and ultimately increase customer satisfaction.

2.1   *Determinants of Healthcare Utilisation among the Elderly*

One of the most frequently used frameworks for analysing the utilisation of healthcare services is the health behavioural model (HBM) developed by Andersen and Newman in 1968. Their seminal study assumes that the utilisation of healthcare services is influenced by a predisposing factor,

enabling factors, and the need to use health services based on individual characteristics. There is a large volume of published studies describing individual characteristic as the determinant for healthcare utilisation (Dhingra et al., 2010; Hoeck, François, Van der Heyden et al., 2011; Laporte, Nauenberg, & Shen, 2008; Sandberg, Kristensson, Midlöv, Fagerström & Jakobsson, 2012; Vegda et al., 2009). However, little is known about individual characteristics as the determinants of healthcare utilisation in relation to the elderly in Malaysia. Thus, this study proposes to identify the determinants of healthcare utilisation and further investigate the relationship between individual characteristics, namely predisposing factors, enabling characteristics and need for care, as guided by the HBM.

2.1.1 *Predisposing factors*

The term predisposing refers to the socio-cultural characteristics of individuals that exist prior to their illness (Andersen & Newman, 1973). This definition takes into account the demographic, socio-structural, and attitudinal variables (Andersen & Newman, 2005). Age, gender, ethnicity, and education will be examined as the variables under predisposing.

Among the demographic variables, age is found to have a significant association with healthcare utilisation (Andersen et al., 1994; Afilalo et al., 2004; Thode et al., 2005; Nabalamba & Millar, 2007; Chen et al., 2008; Moineddin & Upshur, 2008; Blackwell et al., 2009; Dhingra et al., 2010; Nie, Wang, Tracy, Surood & Lai, 2010; Hochhausen et al., 2011). Malaysia's NHMS IV, for example, found that among 28,411 respondents, the elderly aged between 65 years old and older have higher outpatient utilisation and inpatient rate than the other age groups (Institute of Public Health, 2011b).

Some studies have shown the elderly have frequent consultations with general practitioners (Nabalamba & Millar, 2007; Blackwell et al., 2009; Hammond et al., 2010) and need more hospital services, ambulatory services, nursing home utilisation, and home care services (Evashwick, Rowe, Diehr & Branch, 1984). However, some scholars argue that age is no longer a prominent factor as age only indicates the probability of hospitalisation (Liu, 2014), types and number of illnesses, and the different patterns of medical care (Andersen & Newman, 2005). A similar finding in the Netherlands showed that age cannot be justified as the major cause for healthcare expenditures, but instead may act as a proxy for the health status of the elderly (Werblow, Felder & Zweifel, 2007).

Gender is also associated with the utilisation of healthcare services. Women are found to live longer than men, but report greater morbidity and disability and make greater use of healthcare services, particularly at the end of their life (Nathanson, 1975; Verbrugge, 1985; Macintyre, Hunt & Sweeting, 1996; Rieker & Bird, 2005). Females are found to be more

proactive in seeking medical help compared with males (Dunlop, Manheim, Song & Chang, 2002; Redondo-Sendino, Guallar-Castillón, Banegas & Rodríguez-Artalejo, 2006; Krishnaswamy et al., 2009; Dhingra et al., 2010; Bertakis & Azari, 2011; Institute of Public Health, 2011; Liu, 2014). An earlier study indicated that women use more healthcare services than men in terms of visits to general practitioners, home medical visits, medications consumed, and overall utilisation (Redondo-Sendino et al., 2006). The same study reported that the utilisation of healthcare services among women varies according to the type of service required (Redondo-Sendino et al., 2006). Women use preventive and diagnostic services regularly whereas men utilise emergency services (Redondo-Sendino et al., 2006). Furthermore, women are more inclined to contact a general practitioner (Green & Pope, 1999; Bertakis, Azari, Helms, Callahan & Robbins, 2000; Song & Bian, 2014) compared with men though the latter are more frequently hospitalised than women (Mutran & Ferraro, 1988; Fernández-Olano et al., 2006; Song & Bian, 2014).

Studies have shown an association between ethnicity and the utilisation of the healthcare services (Brown et al., 2004; Nabalamba & Millar, 2007; Chen et al., 2008; Blackwell et al., 2009; Dhingra et al., 2010). Malaysia's NHMS reported Indians are the highest to utilise outpatient care, followed by non-Malay Bumiputeras, the Malays and Chinese. Furthermore, Indians have the highest hospitalisation rate followed by Malays and non-Malay Bumiputeras (Institute of Public Health, 2011b).

Education plays an important role in determining an individual's utilisation of available healthcare services. Previous studies have shown that education is significantly associated with utilisation of healthcare services (Andersen et al., 1994; Parslow, Jorm, Christensen & Jacomb, 2002; Chen et al., 2008; Blackwell et al., 2009; Dhingra et al., 2010; Hammond et al., 2010). Similar findings have been reported in a study conducted in Taiwan which finds that the elderly who were better educated utilised more healthcare services (Liu, Tian & Yao, 2012) and used fewer inpatient care (Liu, 2014).

2.1.2 *Enabling resources*

The term enabling refers to the logistical aspects of obtaining care (Aday & Andersen, 1974) while factors related to it make health service resources available to the individual. These factors can be measured by income, health insurance coverage, regular source of care, and the accessibility of the source to the individual. Additionally, the availability of health and personnel facilities contributes to healthcare-seeking behaviour.

Past studies reported the association between income and use of health service use (Andersen et al., 1994; Parslow et al., 2002; Brown et al., 2004;

Bazargan et al., 2008; Blackwell et al., 2009; Dhingra et al., 2010; Hammond et al., 2010; Surood & Lai, 2010). The NHMS 1996 found that the utilisation of healthcare services increases when income increases. The 2006 and 2011 NHMS report respectively found no significant difference between income level and health service utilisation (Institute of Public Health, 2011b).

Apart from income, accessibility plays a substantial part in the selection of healthcare provider. Accessibility to healthcare centres is a serious concern especially in developing countries (Buor, 2002). Accessibility to healthcare is defined as the ability of a population to obtain a specified set of healthcare services (Halden, 2002). In the context of this study, accessibility is referred to as physical accessibility which shows the complex relationship between the distribution of the population and the supply of healthcare facilities (Ebener, Black & Zine El, 2005). A number of studies have measured the impact of distance on healthcare utilisation. The results indicated that distance and access to health care facilities significantly impacted health care utilisation (Mattson, 2012). Moreover, research has indicated that people prefer to access healthcare services which are nearby their homes (Krishnaswamy et al., 2009).

2.1.3 Need for care

Need for care can be defined as the most immediate cause of health service use, encompassing functional and health problems that generate the need for healthcare services (Aday & Andersen, 1974). This definition takes into account specific disabilities or diseases that cause a person to seek medical health. Need for care is considered as an important component in Health Behavioural Model (HBM), and in fact, is the major determinant for healthcare utilisation, which include both perceived need and evaluated need (Andersen & Newman, 2005).

Evaluated need measures are an attempt to get to the actual illness that the individual is experiencing and the clinically-judged severity of that illness (Aday & Andersen, 1974). A physician will examine the individual and make objective measurements regarding the patient's physical status and need for medical care. This is closely related to the type of treatment that will be provided.

On the other hand, perceived need assists in the understanding of care-seeking and adherence to medical regime. In particular, perceived need for health services is how people view and experience their own general health, functional state, and illness symptoms (Aday & Andersen, 1974). It is based on individual characteristics, namely ethnicity, education, and health beliefs (Andersen & Davidson, 2007).

The determinants of healthcare utilisation has been extensively studied (Andersen & Newman, 2005; Snih et al., 2006; Fernández-Olano et al., 2006;

Krishnaswamy et al., 2009; Lee et al., 2010; Saeed et al., 2012). Age, gender, education, poverty, and access to healthcare services have contributed to the utilisation of healthcare services. Healthcare utilisation is well documented in developed countries and in contrast, there is little information on determinants of healthcare utilisation among the elderly people in Malaysia. This study hence attempts to fill the gap in the literature.

3. Methodology

3.1 Data Collection, Sampling and Response Rate

A positivist approach was used to explore the relationship among the variables. A survey was conducted among the elderly outpatients (aged 60 year and above) in 14 public hospitals in Peninsular Malaysia. Questionnaires were distributed to 14 public hospitals in Peninsular Malaysia through cluster sampling from February to April 2016. The locations were divided into four regions, namely Northern region (Perak, Pulau Pinang, Kedah, and Perlis), the Central region (Selangor, Federal Territory of Kuala Lumpur, and Federal Territory of Putrajaya), Southern region (Johor, Melaka, and Negeri Sembilan), and East-Coast region (Pahang, Terengganu, and Kelantan).

A total of 91 Ministry of Health (MOH) hospitals are located in the four regions of Peninsular Malaysia, which are further classified into four types of hospitals, namely state hospital, major specialists hospitals, minor specialists hospitals, and non-specialists hospitals (Ministry of Health, 2010). A total of 500 questionnaires were distributed to the respondents via convenience sampling but only 477 questionnaires returned to the researcher, yielding 95.4% of the response rate.

Based on literature review, variables were derived and measures developed. The questionnaire has three sections: demographic data, need for care, and healthcare utilisation. The questionnaire was translated to Malay language using a guideline for a cross-cultural adaptation and translation of a questionnaire. Questionnaires were modified based on the pre-test and pilot test.

3.2 Measurement

3.2.1 Socio-demographic characteristics and healthcare utilisation

The participants were requested to complete the questions relating to their demographic background, such as age, gender, ethnicity, education level,

income level, and accessibility. In measuring healthcare utilisation, the respondents were asked to recall the frequency of their healthcare utilisation in the last three months in accordance with Ritter et al. (2001) and Bhandari and Wagner, (2006). One open ended question which was "In total, how many times did you receive healthcare or consultation in the last three months?" was constructed by the researcher as suggested by Bhandari and Wagner (2006) as they had mentioned that an open-ended scale is flexible. In addition, a phrase "your best estimate is fine" was added at the end of the question as proposed by Dillman, Smyth and Christian (2008), to overcome the fear of the respondents that they may not be able to provide an accurate estimate.

3.2.2   Need for care

The Health State Descriptors which was adapted from the Study of Global Ageing and Adult Health (SAGE) developed by World Health Organisation in 2011, was used to understand need for care. It was translated into the Malay language following the standard international guidelines and adaptation of self-report measures (Beaton, Bombardier, Guillemin, & Ferraz, 2000). The instrument consisted of 15 items with a five-point-Likert scale response ranging from 1 (strongly disagree) to 5 (strongly agree). There were two subscales, namely psychological functioning, and self-care. Factor one in the instrument was self-care which was developed to measure what people do for themselves to establish and maintain health, prevent and deal with illnesses (World Health Organization, 1998). The second factor assesses the quality of psychological health, such as affective states, memory and attention span (Preedy & Watson, 2010).

Reliability analysis was carried out on all 15 items to measure need for care by using Cronbach's coefficient alpha, which assesses the internal consistency of the items. The Cronbach's alpha for 15 items was found to be 0.82, indicating that there was a good internal consistency among the items (Nunnally & Bernstein, 1994; Robinson, Shaver & Wrightsman, 1991). Upon completion of reliability analysis, exploratory factor analysis (EFA) was conducted to identify groups or clusters of variables. The findings of EFA become a basis for important modifications. Two item was eliminated from further analysis due to low factor loading. Cronbach's Alpha confirmed the reliability of the variables - 0.93, and 0.90 for self-care and psychological functioning respectively.

3.3   Data analysis

Data were analysed using SPSS version 20. Bivariate analyses, such as independent sample t-tests, and one-way ANOVA, were performed to

examine the relationship between individual characteristics and healthcare utilisation. Finally, Hierarchical Multiple Regression (HRM) was used for the purpose of identifying the determinants of healthcare utilisation among the elderly outpatients in Malaysia.

4.   Results

The respondent's age, gender, ethnicity and education were labelled as predisposing factors where income level and accessibility were grouped into enabling resources in this study. The average age of the respondents was 66.69 (SD = 6.08) years old with an age range between 60 to 105 years. The Malays accounted for the highest respondents (74.3%). As for distribution of respondents by education level, data shows that 34 per cent of the respondents completed secondary school. Majority of the respondents (58.4%) earn less than RM1,000 per month. The results are presented in Table 1.

The majority of respondents (56.8%) travelled less than 10km to visit their healthcare providers. In relation to demographic profile of the respondents, frequency and percentage are presented in Table 1. In measuring healthcare utilisation, the respondents were required to recall the frequency of their healthcare utilisation in the last three months. Overall, the elderly outpatient has an average of 1.96 visits to their healthcare providers over the last three months.

Table 2 presents the summary of descriptive statistics for variables under investigation of this study. A total of 13 items were identified as measures grouped under need for care. These items were also collapsed to form a single variable for need. The findings indicate that the respondents view their need for care as moderate (M = 2.45, SD = 0.72). Attention needs to be given to the psychological functioning aspects as the elderly reported higher score on this domain (M = 2.53, SD = 0.72). The elderly reported lower score for self-care domain (M = 2.31, SD = 0.86), which indicate that they were able to manage their daily activities without help.

The relationship between individual characteristics and healthcare utilisation were investigated using individual t-test and one-way ANOVA. There were statistically significant differences in healthcare utilisation for age group, ethnicity, education level and income level. The relationship between need for care and healthcare utilisation was examined using Pearson correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There was a small correlation between the need for care and healthcare utilisation, $r = 0.24$, $n = 447$, $p = 0.00$. Table 3 presents the

individual characteristics of the respondents and their relationship with healthcare utilisation.

Table 1: Demographic profile of the respondents

	Percentage
Age	
Young Old (60-74 years old)	89.5
Old-old (75 years and above)	10.5
Gender	
Male	47.0
Female	53.0
Ethnicity	
Malay	74.3
Chinese	12.8
Indian	13.0
Education level	
No formal education	23.3
Primary school	33.3
Secondary school	34.0
College/University	9.4
Income	
Less than RM1,000	58.4
RM 1,001- RM2,000	26.1
RM 2,001 and above	15.5
Distance	
Less than 10km	56.8
11 to 20km	23.7
More than 20km	19.5

Table 2: Descriptive Analysis for Need for Care

Variables	Min	Max	Mean	SD
Need for care	1.00	5.00	2.45	0.72
Self-care	1.00	5.00	2.31	0.86
Psychological functioning	1.00	5.00	2.53	0.75

Table 3: Healthcare utilisation score and its relationship with
characteristics of the respondents

	Mean	**SD**	***t***	***F***
Age				
Young old	1.85	1.91	-	
Old-old	2.43	1.56	3.03**	
Gender				
Male	2.00	1.31	1.47	
Female	1.83	1.18		
Ethnicity				
Malay	1.88	1.21		0.53
Chinese	2.05	1.51		
Indian	1.97	1.12		
Education level				
No formal education	2.11	1.35		
Primary school	1.90	1.27		4.66**
Secondary school	1.67	1.01		
College/University	2.36	1.34		
Income Level				
Less than RM1,000	1.89	1.29		
RM1,000 to RM2,000	1.94	1.21		3.39*
More than RM2,000	1.93	1.11		
Distance				
Less than 10km	1.94	1.28		
11km to 20km	1.86	1.11		0.172
More than 20km	1.90	1.32		

Note: *$p < 0.05$, ** $p < 0.001$

Bivariate analysis was used to examine the relationship between individual characteristics and healthcare utilisation. The tests were selected based on variable types such as ratio, interval or categorical. A preliminary analysis was conducted to ensure no violation of assumptions of normality, homogeneity of variance (Pallant, 2007) and the presence of outliers; otherwise non-parametric tests were used. As specified in Table 3, result from the independent sample t-tests revealed significant difference in healthcare utilisation between young old group ($M = 1.85$, $SD = 1.19$) and old-old group ($M = 2.43$, $SD = 1.56$); $t (444) = -3.03$, $p = 0.00$. As expected, the elderly aged 75 years and above had significantly higher utilisation rate than young-old group. The same test was conducted to compare healthcare utilisation between male and female. There was no significant difference in healthcare utilisation for males ($M = 2.00$, $SD = 1.31$) and females ($M =

1.83, $SD = 1.18$); $t(445) = 0.40$, $p = 0.14$. These results showed that gender has no effect on healthcare utilisation of the elderly.

A one-way analysis of variance (ANOVA) was conducted to examine the relationship between respondents' ethnic groups and healthcare utilisation. The result revealed that the Chinese ($M = 2.05$, $SD = 1.51$) utilised more healthcare resources than Indians ($M = 1.97$, $SD = 1.12$) and Malays ($M = 1.88$, $SD = 1.22$). However, results also showed that there was no significant difference in these three ethnic groups, $F(2, 444) = 0.29$, $p = 0.08$. Another one-way ANOVA was conducted to examine the differences between education level and healthcare utilisation. Participants were categorised into four groups (no formal education, primary school, secondary school and tertiary education). The result reported significant difference in healthcare utilisation for these four education groups; $F(3, 443) = 4.66$, $p = 0.00$. Despite reaching statistical significance, the actual difference in the mean score between the groups was medium. The effect size, calculated using eta squared, was 0.06. Tukey post-hoc comparisons of the four groups indicate that the mean healthcare utilisation score of tertiary education group ($M = 2.36$, $SD = 1.34$) is significantly higher than the other three groups. As expected, education level determines the utilisation of healthcare resources of the elderly in Malaysia.

Another one-way ANOVA was used to test for healthcare utilisation differences among three levels of income. Respondents were divided into three groups (group 1: less than RM1,000, group 2: RM1,001 to RM2,000 and group 3: RM2,001 and above). The findings revealed that respondents earning between RM1,001 to RM2,000 reported greater healthcare utilisation compared with respondents who earn an income of more than RM2,000. As expected, the difference was significant; $F(2, 437) = 3.39$, $p = 0.03$. In order to investigate further between which groups its mean differs, a post hoc test with Tukey HSD was computed. Thus, Table 3 shows the mean score for those earning an income of RM1,001 to RM2,000 ($M = 1.94$, $SD = 1.21$) was significantly different from respondents who earn an income of more than RM2,001 ($M = 1.93$, $SD = 1.11$) with $p = 0.03$. However, respondents who earned less than RM1,000 ($M = 1.89$, $SD = 1.24$) did not differ significantly from the other groups.

In order to examine the relationship between accessibility and healthcare utilisation, respondents were asked to provide information on their travel distance, mode of transportation and travel time. Travel distance was divided into three categories (less than 10km, 11 to 20 km and more than 20km). A one-way ANOVA was conducted to shown the link between travel distance and healthcare utilisation. The results revealed that there was no significance difference between travel distance and healthcare utilisation $F(2, 444) = 0.17$, $p = 0.84$. Finally, the relationship between need for care and healthcare utilisation was examined using Pearson Product Moment

Correlation Coefficient. The result revealed that there is a positive significant association ($r = 0.24$, $n = 447$, $p = 0.00$) between need for care and healthcare utilisation.

Finally, Hierarchical Multiple Regression analysis indicated that elderly patients' age, education level, income, need for care and attitude to ageing were significant factors that predict healthcare utilisation. The total variance explained by the model was 13.5% (F $(2,419) = 18.437$, $p < 0.05$).

5.   Discussion

A survey was conducted among 447 elderly outpatients in Peninsular Malaysia with the objective of identifying significant predictors of healthcare utilisation. Findings indicate that the elderly in the old-old group, Chinese with tertiary education, and those who earned RM1,001 to RM2,000, had a moderate need for care with an average of 1.96 visits to their healthcare providers in the last three months.

Four individual characteristics including age, education level, income level and need for care were significant predictors of healthcare utilisation among the elderly outpatients in Malaysia. In relation to age, independent sample t-tests were computed to test the association between age and healthcare utilisation. The result revealed that the elderly aged above 75 (M = 2.43, SD = 1.56) had a significantly higher healthcare utilisation than the younger group. Similar results were reported in previous studies conducted in Malaysia (Institute of Public Health, 2011a) and Ireland (McNamara & Normand, 2013). In addition, the current study found that age was a significant contributor towards utilisation of healthcare services ($t = 2.15$, $p = 0.03$). The findings are consistent with those of previous studies, which showed that the elderly had a higher rate of healthcare use (Blackwell et al., 2009; Hammond, Matthews, & Corbie-Smith, 2010; Nabalamba & Millar, 2007; Afilalo et al., 2004; Andersen et al., 1994; Blackwell et al., 2009; Bowling et al., 1991; Chen et al., 2008; Dhingra et al., 2010; González-González et al., 2011; Hochhausen et al., 2011; Liu, 2014; Nabalamba & Millar, 2007; Nie et al., 2008; Schäfer et al., 2012; Surood & Lai, 2010; Thode et al., 2005).

There are several explanations for this. First, ageing is characterised by progressive loss of adaptability (Evans & Stoddart, 2003), deterioration of many organs and systems (Ritter et al., 2001) which leads to lower effectiveness of physiological functions and accompanied by an increase in risk factors for various diseases (Hamid, Verbrugge & Abdul, 2007), thus requiring additional medical attention. Moreover, these relationships may partly be explained by the fact that 80 per cent of the elderly have at least one chronic condition (Centers for Disease Control and Prevention, 2011).

Chronic diseases limit a person's ability to perform daily activities causing them to lose their independence, and result in the need for institutionalised care, in-home caregivers or other long-term services and support (Centers for Disease Control and Prevention, 2013). Therefore, it can be concluded that age is a significant determinant of healthcare utilisation among the elderly in Malaysia.

This study has concluded that Indians have the highest utilisation of healthcare services (M = 2.23, SD = 1.27), followed by Malays (M = 1.88, SD = 0.97), while the Chinese (M = 1.83, SD = 1.20) had the lowest. This finding corroborates findings of previous NHMS conducted in Malaysia in 1996, 2006 and 2016. In these surveys, Indians were reported to have the highest utilisation of out-patient care and public healthcare services and facilities (Institute of Public Health, 2011a). There are some possible explanations for this. First, the prevalence of diabetes and coronary heart diseases is high among the Indian elderly (Teh, Tey & Ng, 2014) due to genetic susceptibility to diabetes and urbanisation (the later contributes to a sedentary lifestyle) (Ramachandran et al., 2001; Ramachandran, Snehalatha, Latha, Manoharan, & Vijay, 1999; Teh et al., 2014). Second, Indians are known as having lower tolerance to pain (Tsui, Chen, & Ng, 2010) where cultural factors strongly influence the expression of pain. The Indian community express their pain and grief openly whereas, the Chinese belief that expressing pain openly may be seen as a sign of weakness (Tsui et al., 2010).

The second predisposing factor found to be significantly associated with healthcare utilisation is respondent's education level (F = 12.33, p = 0.00). These findings are consistent with those of previous studies (Andersen et al., 1994; Blackwell et al., 2009; Chen et al., 2008; Dhingra et al., 2010; Hammond et al., 2010; Liu et al., 2012; Parslow et al., 2002). Based on these findings, it is possible to conclude that higher level of education serve as an important determinant of healthcare use. The below are possible reasons for this. First, Fletcher and Frisvold (2009) suggest that those with higher educational level educated people, are more informed and better able to process available information about medical care. Second, education is an enduring resource that is related to sustained happiness and serenity, which in turn is related to their vitality and health in later years (Murrell, Salsman & Meeks, 2003). Finally, higher education level is expected to offer better occupational opportunities, which would result in improved financial and social status. It can thus be suggested that education level is a significant factor for healthcare utilisation among the elderly outpatients in Malaysia.

Enabling resources, namely income level and accessibility, were found to have positive association with healthcare utilisation. This study found that income was significantly associated with healthcare utilisation (F = 6.25, p = 0.00), confirming the findings of previous studies (Andersen et al., 1994;

Bazargan et al., 2008; Blackwell et al., 2009; Brown et al., 2004; Dhingra et al., 2010; Hammond et al., 2010; Parslow et al., 2002; Surood & Lai, 2010). Samsudin, Applanaidu, Jaafar, Ali and Majid (2013) reported that the higher the income of an individual the higher the likelihood to visit a doctor. This could be because higher income increases individual's purchasing power, allowing them to demand and utilise healthcare services. It is also believed that people with higher income levels can easily satisfy their basic needs such as food, housing and health (Momtaz, Ibrahim, Hamid & Yahaya, 2010).

In this study, need for care was determined using Health State Descriptors (WHO, 2011b) with a total of 13 items measuring self-care and psychological functioning. Findings revealed that need for care was significantly associated with healthcare utilisation ($r = 0.24$, $n = 447$, $p = 0.00$). This is consistent with the findings of previous studies (Anderson, 1973; Connelly et al., 1989; Dunlop, Coyte & McIsaac, 2000; Fernández De La Hoz & Leon, 1996; Fernández-Olano et al., 2006; Fylkesnes, 1993; Hulka & Wheat, 1985; Lam, Fong, Lauder & Lam, 2002; Parslow et al., 2002; Phillips, Morrison, Andersen & Aday, 1998) which found that need for care is an important predictor of health service utilisation. There are several reasons for this. Evidence persistently shows lower health status results in the increase of all types of healthcare utilisation. For example, clinic visits, physician visits and hospitalisation (Anderson & Newman, 1973; Hershey, Luft, & Gianaris, 1975; Hulka & Wheat, 1985; Muller, 1986). Moreover, research found that elderly with multiple chronic conditions and disabilities utilised more healthcare services (Johansen, Nair & Bond, 1994).

The findings of this study are useful for better understanding of healthcare needs among the elderly for the development of new policies, which will alleviate the perceived crisis in healthcare. Measure of healthcare utilisation plays a critical role in planning the healthcare delivery capacity to meet the needs of the elderly. As the ageing population is growing in Malaysia, the country should focus on geriatric cares services, including access to quality geriatric healthcare services, increasing professional skills, investing in upgrading the quality of geriatric care in hospitals, promoting close engagement with communities to remove cultural constraints, and improving the acceptability of modern healthcare services and monitoring services. Moreover, the policy makers need to sustain a multi-sectorial support and the ability to keep elderly people's health high on the country's policy agenda will require continued advocacy.

6.   Conclusion

This study showed the link between predisposing factors, enabling characteristics and need for care, with healthcare utilisation. Findings revealed that the determinants of healthcare utilisation among the elderly are influenced by various factors such as age, education level, income level and need for care. However, healthcare providers and policy makers have often neglected the role of demographic features and trends when designing and evaluating health education, health promotion, and health prevention strategies. It is important to understand how the elderly access, interpret, and apply information to ensure the good delivery of health services. An important point to note is that the elderly are not a heterogeneous group. New programmes and services for the elderly must factor this and in addition to ensuring health promotion messages are delivered in a language and settings that are familiar to them.

The primary aim of this exploratory study was to improve the understanding of the healthcare utilisation among the elderly people in Malaysia. It has contributed to providing useful, of the current body of knowledge. Additionally, the recommendations provided are beneficial to policy makers and practitioners. The review of literature showed that the there are several health services provided for the elderly people in Malaysia. However, they are inadequate in its scope and breadth and worsened by the growing ageing population in Malaysia. Thus, it is suggested the relevant authorities develop a proactive community-based healthcare for the elderly people like in Japan. The current policy and programmes only focused on the dependent or disabled or the elderly poor. Therefore, policies, programmes and services must cater to all the elderly regardless of their background, gender and socio economic status. Future policies and programmes must be able to assist the elderly to become independent.

This study has its limitation where the sample was limited to the elderly in Peninsular Malaysia only. Therefore, the generalisability of these results is subject to certain limitations, whereby it did not take into consideration the situation of the target group in Sabah and Sarawak.

Acknowledgement

References

Aday, L. a, & Andersen, R. (1974). A framework for the study of access to medical care. *Health Services Research*, *9*(3), 208–20. Retrieved from http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1071804&tool=pmcentrez&rendertype=abstract

Afilalo, J., Marinovich, A., Afilalo, M., Colacone, A., Léger, R., Unger, B., & Giguère, C. (2004). Nonurgent emergency department patient characteristics and barriers to primary care [corrected] [published erratum appears in ACAD EMERG MED 2005 Jan;12(1):12]. *Academic Emergency Medicine*, *11*, 1302–1310. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=c8h&AN=2005071643&site=ehost-live

Ambigga, K. S., Ramli, A. S., Suthahar, A., Tauhid, N., Clearihan, L., & Browning, C. (2011). Bridging the gap in ageing: Translating policies into practice in Malaysian Primary Care. *Asia Pacific Family Medicine*, *10*(1), 2. https://doi.org/10.1186/1447-056X-10-2

Andersen, R. M., & Davidson, P. L. (2007). *Changing the US health care system: key issues in health services policy and management. 3rd Edition* (3rd Edition). San Fransisco: Jossey-Bass.

Andersen, R. M., Davidson, P. L., & Ganz, P. A. (1994). Symbiotic relationships of quality of life, health services research and other health research. *Quality of Life Research : An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation*, *3*, 365–371.

Andersen, R., & Newman, J. F. (1973). Societal and individual determinants of medical care utilisation in the United States. *The Milbank Memorial Fund Quarterly*, *51*, 95–124. https://doi.org/10.1111/j.1468-0009.2005.00428.x

Andersen, R., & Newman, J. F. (2005). Societal and individual determinants of medical care utilization in the United States. *The Milbank Memorial Fund Quarterly. Health and Society*, *51*(1), 95–124. https://doi.org/10.2307/3349613

Anderson, J. G. (1973). Health services utilization: framework and review. *Health Services Research*, *8*, 184–199.

Aoife McNamara, Charles Normand, B. W. (2013). *Patterns and Determinants of Healthcare Utilisation in Ireland*.

Bazargan, M., Ani, C. O., Hindman, D. W., Bazargan-Hejazi, S., Baker, R. S., Bell, D., & Rodriquez, M. (2008). Correlates of complementary and alternative medicine utilization in depressed, underserved african american and Hispanic patients in primary care settings. *Journal of Alternative and Complementary Medicine (New York, N.Y.)*, *14*, 537–544. https://doi.org/10.1089/acm.2007.0821

Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine, 25*(24), 3186-3191.

Bertakis, K. D., & Azari, R. (2011). Determinants and outcomes of patient-centered care. *Patient Education and Counseling*, *85*(1), 46–52. https://doi.org/10.1016/j.pec.2010.08.001

Bertakis, K. D., Azari, R., Helms, L. J., Callahan, E. J., & Robbins, J. A. (2000). Gender differences in the utilization of health care services. *The Journal of Family Practice*, *49*, 147–152.

Bhandari, A., & Wagner, T. (2006). Self-reported utilization of health care services: improving measurement and accuracy. *Medical Care Research and Review*, *63*(2), 217–235. https://doi.org/10.1177/107755 8705285298

Blackwell, D. L., Martinez, M. E., Gentleman, J. F., Sanmartin, C., & Berthelot, J.-M. (2009). Socioeconomic status and utilization of health care services in Canada and the United States: findings from a binational health survey. *Medical Care*, *47*, 1136–1146. https://doi.org/10.1097/MLR.0b013e3181adcbe9

Bowling, A., Farquhar, M., & Browne, P. (1991). Use of services in old age: data from three surveys of elderly people. *Soc Sci Med*, *33*, 689–700. Retrieved from http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=1957189

Brown, E. R., Davidson, P. L., Yu, H., Wyn, R., Andersen, R. M., Becerra, L., & Razack, N. (2004). Effects of community factors on access to ambulatory care for lower-income adults in large urban communities. *Inquiry*, *41*, 39–56. https://doi.org/10.5034/inquiryjrnl_41.1.39

Buor, D. (2002). Distance as a predominant factor in the utilisation of health services in the Kumasi metropolis, Ghana. *GeoJournal*, *56*, 145–157. https://doi.org/10.1023/A:1022452311911

Centers for Disease Control and Prevention. (2011). *Healthy Aging at a Glance 2011*. Retrieved from https://stacks.cdc.gov/view/cdc/22022

Centers for Disease Control and Prevention. (2013). *The State of Ageing and Health in America*. *Centers for Disease Control and Prevention US Dept of Health and Human Services*.

Chen, A. W., Kazanjian, A., & Wong, H. (2008). Determinants of mental health consultations among recent Chinese immigrants in British Columbia, Canada: implications for mental health risk and access to services. *Journal of Immigrant and Minority Health / Center for Minority Public Health*, *10*, 529–540. https://doi.org/10.1007/s10903-008-9143-5

Connelly, J. E., Philbrick, J. T., Smith, G. R., Kaiser, D. L., & Wymer, A. (1989). Health perceptions of primary care patients and the influence on health care utilization. *Medical Care*, *27*, S99–S109.

Department of Statistics Malaysia Official Portal. (2015). Retrieved April 12, 2017, from https://www.dosm.gov.my/v1/index.php?r=column/ctheme&menu_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09&bul_id=OWlxdEVoYlJCS0hUZzJyRUcvZEYxZz09

Dhingra, S. S., Zack, M., Strine, T., Pearson, W. S., & Balluz, L. (2010). Determining prevalence and correlates of psychiatric treatment with Andersen's behavioral model of health services use. *Psychiatric Services (Washington, D.C.)*, *61*, 524–528. https://doi.org/10.1176/appi.ps.61.5.524

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2008). *Internet, phone, mail, and mixed-mode surveys: the tailored design method*. John Wiley & Sons.

Dunlop, D. D., Manheim, L. M., Song, J., & Chang, R. W. (2002). Gender and ethnic/racial disparities in health care utilization among older adults. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *57*(3), S221–S233.

Dunlop, S., Coyte, P. C., & McIsaac, W. (2000). Socio-economic status and the utilisation of physicians' services: results from the Canadian National Population Health Survey. *Social Science & Medicine (1982)*, *51*, 123–33. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/1017475

Ebener, S., & Zine El, M. (2005). Physical accessibility to health care: from isotropy to anisotropy. *GIS Development*, *9*(6), 34–36. Retrieved from http://www.who.int/kms/initiatives/Ebener_et_al_2005.pdf

Evans, R. G., & Stoddart, G. L. (2003). Consuming research, producing policy? *American Journal of Public Health*. https://doi.org/10.2105/AJPH.93.3.371

Fernández-Olano, C., Hidalgo, J. D. L.-T., Cerdá-Díaz, R., Requena-Gallego, M., Sánchez-Castaño, C., Urbistondo-Cascales, L., & Otero-Puime, A. (2006). Factors associated with health care utilization by the elderly in a public health care system. *Health Policy (Amsterdam, Netherlands)*, *75*(2), 131–9. https://doi.org/10.1016/j.healthpol.2005.02.005

Fernández De La Hoz, K., & Leon, D. A. (1996). Self-perceived health status and inequalities in use of health services in Spain. *International Journal of Epidemiology*, *25*, 593–603. https://doi.org/10.1093/ije/25.3.593

Fletcher, J. M., & Frisvold, D. E. (2009). Higher education and health investments: Does more schooling affect preventive health care sse? *Journal of Human Capital*, *3*(2), 144–176. https://doi.org/10.1086/645090

Fylkesnes, K. (1993). Determinants of health care utilization--visits and referrals. *Scandinavian Journal of Social Medicine*, *21*, 40–50.

Gamme, C., & Morin, J. (2009). Health determinants that influence the seeking and utilization of health care A qualitative study among non-natives.

Geriatricians in Malaysia - MSGM. (n.d.). Retrieved June 3, 2015, from https://sites.google.com/a/ummc.edu.my/msgm/annual-report-2013/interim-report-2013-2014/geriatricians-in-malaysia

González-González, C., Sánchez-García, S., Juárez-Cedillo, T., Rosas-Carrasco, O., Gutiérrez-Robledo, L. M., & García-Peña, C. (2011). Health care utilization in the elderly Mexican population: expenditures and determinants. *BMC Public Health*, *11*, 192. https://doi.org/10.1186/1471-2458-11-192

Green, C., & Pope, C. (1999). Gender, psychosocial factors and the use of medical services: a longitudinal analysis. *Social Science & Medicine*, *48*, 1363–72. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/10369437

Halden, D. (2002). Using accessibility measures to integrate land use and transport policy in Edinburgh and the Lothians. *Transport Policy*, *9*(4), 313–324. https://doi.org/10.1016/S0967-070X(02)00017-3

Hamid, S. S., Verbrugge, L. M., & Abdul, T. A. T. (2007). Sidiah.

Hammond, W. P., Matthews, D., & Corbie-Smith, G. (2010). Psychosocial factors associated with routine health examination scheduling and receipt among African American men. *Journal of the National Medical Association*, *102*, 276–289.

Hershey, J. C., Luft, H. S., & Gianaris, J. M. (1975). Making sense out of utilization data. *Medical Care, 13*(10), 838-854.

Hochhausen, L., Le, H. N., & Perry, D. F. (2011). Community-based mental health service utilization among low-income Latina immigrants. *Community Mental Health Journal*, *47*, 14–23. https://doi.org/10.1007/s10597-009-9253-0

Hoeck, S., François, G., Van der Heyden, J., Geerts, J., & Van Hal, G. (2011). Healthcare utilisation among the Belgian elderly in relation to their socio-economic status. *Health Policy (Amsterdam, Netherlands)*, *99*(2), 174–82. https://doi.org/10.1016/j.healthpol.2010.08.010

Hulka, B. S., & Wheat, J. R. (1985). Patterns of utilization. The patient perspective. *Medical Care*, *23*, 438–460. https://doi.org/10.1097/00005650-198505000-00009

Institute for Health Systems Researchhcd & Institute for Health Policy. (2013). Malaysia Health Care Demand Analysis: Inequalities in Healthcare Demand; Simulation of Trends and Impact of Potential Changes in Healthcare Spending. Retrieved from http://www.ihp.lk/publications/publication.html?id=933

Institute for Public Health. (2011). *National Health and Morbidity Survey 201I (NHMS 2011). Vol. I : Methodology & General Findings.*

Institute of Public Health. (2011a). *National health and morbidity survey 2011 (NHMS 2011) Vol III: Healthcare demand and out-of-pocket health expenditure*.

Institute of Public Health. (2011b). *National Health and Morbidity Survey 2011 (NHMS 2011) Volume II: Non communicable diseases*.

Institute of Public Health Malaysia. (2015). *National Health and Morbidity Survey*.

Johansen, H., Nair, C., & Bond, J. (1994). Who goes to the hospital? An investigation of high users of hospital days. *Health reports, 6*(2), 253.

Kefeli, Z., & Zaidi, M.A.S. (2013). Health care utilisation among the elderly in Malaysia: Does socioeconomic status matters? Persidangan Kebangsaan Ekonomi Malaysia ke-VIII (PERKEM VIII), 1141-1152.

Krishnaswamy, S., Subramaniam, K., Low, W. Y., Aziz, J. A., Indran, T., Ramachandran, P., … & Patel, V. (2009). Factors contributing to utilization of health care services in Malaysia: a population-based study. *Asia-Pacific Journal of Public Health / Asia-Pacific Academic Consortium for Public Health*, *21*(4), 442–50. https://doi.org/10.1177/1010539509345862

Lam, C. L. K., Fong, D. Y. T., Lauder, I. J., & Lam, T.-P. D. (2002). The effect of health-related quality of life (HRQOL) on health service utilisation of a Chinese population. *Social Science and Medicine (1982)*, *55*, 1635–46. Retrieved from http://www.ncbi.nlm.nih.gov/pub med/12297248

Laporte, A., Nauenberg, E., & Shen, L. (2008). Aging, social capital, and health care utilization in Canada. *Health Economics, Policy, and Law*, *3*(Pt 4), 393–411. https://doi.org/10.1017/S1744133108004568

Lee, S.-Y. D., Tsai, T.-I., Tsai, Y.-W., & Kuo, K. N. (2010). Health literacy, health status, and healthcare utilization of Taiwanese adults: results from a national survey. *BMC Public Health*, *10*(1), 614. https://doi.org/10.1186/1471-2458-10-614

Liu, L.-F. (2014). The health heterogeneity of and health care utilization by the elderly in Taiwan. *International Journal of Environmental Research and Public Health*, *11*(2), 1384–97. https://doi.org/10.3390/ijerph110201384

Liu, L.-F., Tian, W.-H., & Yao, H.-P. (2012). Utilization of health care services by elderly people with National Health Insurance in Taiwan: the heterogeneous health profile approach. *Health Policy (Amsterdam, Netherlands)*, *108*, 246–55. https://doi.org/10.1016/j.healthpol.2012.08.022

Macintyre, S., Hunt, K., & Sweeting, H. (1996). Gender differences in health: Are things really as simple as they seem? *Social Science and Medicine*, *42*, 617–624. https://doi.org/10.1016/0277-9536(95)00335-5

Mattson, J. (2012). Transportation, distance, and health care utilization for older adults in rural and small urban areas. *Transportation Research Record: Journal of the Transportation Research Board.* https://doi.org/10.3141/2265-22

Ministry of Health. (2010). *Ministry of Health, Speacility and Subspeciality Framework of Ministry of Health Hospitals: 10 mp*

Mohd Sidik, S., Mohd Zulkefli, N.A., & Mustaqim, A. (2003). Prevalence of depression with chronic illness among the elderly in a rural community in Malaysia. *Asia Pacific Family medicine, 2*(4), 196-199.

Momtaz, Y. A., Ibrahim, R., Hamid, T. A., & Yahaya, N. (2010). Mediating effects of social and personal religiosity on the psychological well being of widowed elderly people. *OMEGA--Journal of Death and Dying*, *61*(2), 145–162. https://doi.org/10.2190/OM.61.2.d

Muller, C. (1986). Health and health care of employed women and homemakers: Family factors. *Women and Health, 11*(1), 7-26.

Murrell, S. a, Salsman, N. L., & Meeks, S. (2003). Educational attainment, positive psychological mediators, and resources for health and vitality in older adults. *Journal of Aging and Health*, *15*(4), 591–615. https://doi.org/10.1177/0898264303256198

Mutran, E., & Ferraro, K. F. (1988). Medical need and use of services among older men and women. *J Gerontol*, *43*, S162-71. Retrieved from http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=2971089

Nabalamba, A., & Millar, W. J. (2007). Going to the doctor. *Health Reports, 18*, 23–35.

Nathanson, C. A. (1975). Illness and the feminine role: a theoretical review. *Social Science & Medicine*, *9*, 57–62. https://doi.org/10.1016/0037-7856(75)90094-3

Nie, J. X., Wang, L., Tracy, C. S., Moineddin, R., & Upshur, R. E. (2008). Health care service utilization among the elderly: Findings from the study to understand the chronic condition experience of the elderly and the disabled (SUCCEED project). *Journal of Evaluation in Clinical Practice*, *14*, 1044–1049. https://doi.org/10.1111/j.1365-2753.2008.00952.x

Nunnally, J., & Bernstein, I. (1994). Psychometric Theory, 3rd edn, 1994. *McGraw-Hill, New York*, *3*, 701. Retrieved from http://scholar.google.com.vn/scholar?q=Psychometric+Theory+3rd&btnG=&hl=vi&as_sdt=0,5#0

Pallant, J. (2007). *SPSS Survival Manual: A Step by Step Guide to Data Analysis using SPSS for Windows (3rd Edition).* New South Wwales: Open University Press.

Parslow, R., Jorm, A., Christensen, H., & Jacomb, P. (2002). Factors associated with young adults' obtaining general practitioner services.

Australian Health Review : A Publication of the Australian Hospital Association, *25*, 109–118. https://doi.org/10.1071/AH020109a

Phillips, K. A., Morrison, K. R., Andersen, R., & Aday, L. A. (1998). Understanding the context of healthcare utilization: assessing environmental and provider-related variables in the behavioral model of utilization. *Health Services Research*, *33*, 571–596.

Poi, P. J. H., Forsyth, D. R., & Chan, D. K. Y. (2004). Services for older people in Malaysia: issues and challenges. *Age and Ageing*, *33*(5), 444–6. https://doi.org/10.1093/ageing/afh182

Preedy, V. R., & Watson, R. R. (2010). Handbook of Disease Burdens and Quality of Life Measures. *Quality*, *1999*(21), 1221–1332. https://doi.org/10.1007/978-0-387-78665-0

Ramachandran, A., Snehalatha, C., Kapur, A., Vijay, V., Mohan, V., Das, A. K., … Nair, J. D. (2001). High prevalence of diabetes and impaired glucose tolerance in India: National Urban Diabetes Survey. *Diabetologia*, *44*(9), 1094–1101. https://doi.org/10.1007/s001250100627

Ramachandran, A., Snehalatha, C., Latha, E., Manoharan, M., & Vijay, V. (1999). Impacts of urbanisation on the lifestyle and on the prevalence of diabetes in native Asian Indian population. *Diabetes Research and Clinical Practice*, *44*(3), 207–213. http://doi.org/10.1016/S0168-8227(99)00024-8

Rashid, A. K., Azizah, A. M., & Rohana, S. (2012). Cognitive impairment among the elderly malays living in rural Malaysia. *Medical Journal of Malaysia*. Retrieved from http://www.e-mjm.org/2012/v67n2/cognitive-impairment.pdf%5Cnhttp://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed11&NEWS=N&AN=2013145108

Rechel, B., & Doyle, Y. (2009). *How can health systems respond to population ageing. World Health Organization 2009 and World Health Organization, on behalf of the European Observatory on Health Systems and Policies.* Retrieved from http://www.observatorysummerschool.org/materiale2011/113/policy_brief_10_aging_web.pdf

Redondo-Sendino, A., Guallar-Castillón, P., Banegas, J. R., & Rodríguez-Artalejo, F. (2006). Gender differences in the utilization of health-care services among the older adult population of Spain. *BMC Public Health*, *6*, 155. https://doi.org/10.1186/1471-2458-6-155

Rieker, P. P., & Bird, C. E. (2005). Rethinking gender differences in health: why we need to integrate social and biological perspectives. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *60 Spec No*, 40–47. https://doi.org/10.1093/geronb/60.Special_Issue_2.S40

Ritter, P. L., Stewart, A. L., Kaymaz, H., Sobel, D. S., Block, D. a., & Lorig, K. R. (2001). Self-reports of health care utilization compared to

provider records. *Journal of Clinical Epidemiology*, *54*(2), 136–141. https://doi.org/10.1016/S0895-4356(00)00261-4

Robinson, J. P., Shaver, P. R., & Wrightsman, L. S. (1991). Criteria for scale selection and evaluation. *Measures of Personality and Social Psychological Attitudes, 1*(3), 1-16.

Saeed, B. I. I., Oduro, S. D., Ebenezer, A. M. F. E., & Zhao, X. (2012). Determinants of healthcare utilization among the ageing population in Ghana, *International Journal of Business and Social Science, 3*(24), 66–77.

Samsudin, S., Applanaidu, S., Jaafar, A., Ali, J., & Majid, R. (n.d.). Performance of public hospitals in Malaysia and its determinants: An analysis using data envelopment and Tobit Model. *Pakinsight.com*. Retrieved from http://www.pakinsight.com/ebooks/ICETSR- 153-(807-815).pdf

Sandberg, M., Kristensson, J., Midlöv, P., Fagerström, C., & Jakobsson, U. (2012). Prevalence and predictors of healthcare utilization among older people (60+): focusing on ADL dependency and risk of depression. *Archives of Gerontology and Geriatrics*, *54*(3), e349-63. https://doi.org/10.1016/j.archger.2012.02.006

Schäfer, I., Hansen, H., Schön, G., Höfels, S., Altiner, A., Dahlhaus, A., … Wiese, B. (2012). The influence of age, gender and socio-economic status on multimorbidity patterns in primary care. first results from the multicare cohort study. *BMC Health Services Research*. https://doi.org/10.1186/1472-6963-12-89

Selvaratnam, D. P., Abu Bakar, N., & Idris, N. A. (2012). The health determinants of elderly Malaysian population. *Prosiding PERKEM VII(2).* 1195–1199.

Snih, S. Al, Markides, K. S., Ray, L. A., Freeman, J. L., Ostir, G. V, & Goodwin, J. S. (2006). Of examine the effect of physician and hospital use among older Mexican Americans …, *16*.

Song, Y., & Bian, Y. (2014). Gender differences in the use of health care in China: cross-sectional analysis. *International Journal for Equity in Health*, *13*, 8. https://doi.org/10.1186/1475-9276-13-8

Surood, S., & Lai, D. W. L. (2010). Impact of culture on use of Western health services by older South Asian Canadians. *Canadian Journal of Public Health*, *101*, 176–180.

Teh, J. K. L., Tey, N. P., & Ng, S. T. (2014). Ethnic and gender differentials in non-communicable diseases and self-rated health in Malaysia. *PloS One*, *9*(3), e91328. http://doi.org/10.1371/journal.pone.0091328

Teng, Y. Y. (2015, May 27). Old folk too easily forgotten - Community. The Star Online. Kuala Lumpur, Malaysia. Retrieved from http://www.thestar.com.my/Metro/Community/2015/05/27/Old-folk-too-easily-forgotten-There-is-a-need-to-tackle-the-lack-of-

preparedness-in-caring-for-an-ag/

Thode, N., Bergmann, E., Kamtsiuris, P., & Kurth, B. M. (2005). [Predictors for ambulatory medical care utilization in Germany]. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz*, *48*, 296–306. https://doi.org/10.1007/s00103-004-1004-3

Tsui, S. L., Chen, P. P., & Ng, K. F. J. (2010). *Pain Medicine: A Multidisciplinary Approach*. Hong Kong University Press. https://doi.org/10.1016/j.ejpain.2011.05.009

United Nations. (2002). *World Population Ageing 1950-2050. New York: United Nations* (Vol. 26). New York.

Vegda, K., Nie, J. X., Wang, L., Tracy, C. S., Moineddin, R., & Upshur, R. E. G. (2009). Trends in health services utilization, medication use, and health conditions among older adults: a 2-year retrospective chart review in a primary care practice. *BMC Health Services Research*, *9*, 217. https://doi.org/10.1186/1472-6963-9-217

Verbrugge, L. M. (1985). Gender and health: an update on hypotheses and evidence. *Journal of Health and Social Behavior*, *26*, 156–182. https://doi.org/10.2307/2136750

Wan Ahmad, W. I. ., & Ismail, Z. (2014). Some socioeconomics characteristics of older population in Malaysia. *World Applied Sciences Journal*, *30*(7), 891–894. Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-84874543658&partnerID=40&md5=33715ad4ec560b248e3a6e89742c2445

Werblow, A., Felder, S., & Zweifel, P. (2007). Population ageing and health care expenditure: A school of "Red Herrings"? *Health Economics*, *16*, 1109–1126. http://doi.org/10.1002/hec.1213

WHO. (2011a). *Global Health and Aging*.

WHO. (2011b). *WHO | SAGE longitudinal multi-country study*. World Health Organization. Retrieved from http://www.who.int/healthinfo/sage/cohorts/en/index2.html

WHO. (2012). *Good health adds life to years Global brief for World Health Day 2012*. Geneva.

WHO. (2013). Mental health and older adults. Retrieved June 4, 2015, from http://www.who.int/mediacentre/factsheets/fs381/en/

World Health Organization. (1998). *The role of the pharmacist in self-care and self-medication*. *World Health Organisation*. Retrieved from http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:The+Role+of+the+Pharmacist+in+Self-Care+and+Self-Medication#0