HEALTH NEEDS AMONG OLDER PERSON WITH DIABETES IN PENANG: A MIXED METHOD STUDY

By

Dr Ahmad Hanis bin Ahmad Shushami

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Department of Community Medicine

Universiti Sains Malaysia

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Latar belakang

Kesihatan adalah keadaan kesejahteraan fizikal, mental, dan sosial yang lengkap dan bukan sekadar ketiadaan penyakit atau kekurangan. Oleh kerana kesihatan terdiri daripada pelbagai aspek, keperluan kesihatan untuk warga emas juga luas. Ini dicirikan oleh kesan sinergistik pelbagai aspek yang merangkumi fizikal, mental, sosial, perkhidmatan, kerohanian, kewangan dan persekitaran. Di Malaysia, kebanyakan kajian memfokuskan pada keperluan kesihatan fizikal, mental, kewangan, atau persekitaran secara berasingan. Kajian yang menggabungkan pelbagai aspek kesihatan adalah terhad. Oleh itu, kajian ini mempertimbangkan pelbagai aspek kesihatan secara serentak dalam menentukan keperluan kesihatan bagi warga emas penghidap Kencing Manis.

Kaedah

Ini adalah kajian kaedah gabungan, dengan reka bentuk penjelasan berurutan yang dilakukan antara antara Oktober 2018 hingga Ogos 2020. Reka bentuk dua fasa ini dimulakan dengan pengumpulan dan analisa data kuantitatif, diikuti dengan pengumpulan dan analisa temubual kualitatif secara berturutan, menggunakan pendekatan fenomenologi. Bahagian kuantitatif dijalankan antara April 2019 dan Ogos 2019, diikuti dengan bahagian kualitatif bermula akhir Ogos 2019 hingga April 2020.

Fasa pertama kajian ini menggunakan kajian keratan rentas untuk mengenal pasti keperluan kesihatan dan faktor-faktor yang berkaitan. Ia menggunakan soal mengenai

keperluan penjagaan kesihatan yang telah dibangunkan oleh Pertubuhan Kesihatan Sedunia (WHO) yang mengandungi 13 soalan. Kajian ini melibatkan 417 sampel yang dipilih secara rawak dari fasiliti kesihatan kerajaan di Pulau Pinang, Malaysia. Skornya diringkaskan menjadi min tunggal, yang berjumlah antara 1 hingga 5. Kajian tahap kedua menggunakan temu ramah mendalam, bertujuan meneroka keperluan kesihatan dan mennjelaskan keputusan-keputusan semasa fasa pertama. Temubual dilakukan keatas mereka yang mempunyai keperluan kesihatan yang tinggi hingga rendah. Responden adalah 15 sampel yang dipilih secara pensampelan bertujuan, berasal dari subset kajian fasa satu

Keputusan

Untuk kajian tahap satu, keperluan kesihatan diukur dengan skor keperluan penjagaan kesihatan. Min dan sisihan piawai (SP) keperluan keseluruhan untuk penjagaan adalah rendah, iaitu 1,66 dan 0.66. Kajian kami mendapati bahawa ada regresi linear positif yang ketara antara kelompok usia, perasaan terhadap jarak ke fasiliti kesihatan, pengangkutan ke fasiliti kesihatan, aturan tempat tinggal dan kecacatan, terhadap keperluan kesihatan. Terdapat juga hubungan regresi linear negatif yang ketara antara sumber pendapatan dan keperluan kesihatan. [F (11,405) = 11,01, p <0,001], dengan R2 0,37. Bahagian kedua kajian dirancang untuk menjelaskan keputusan yang dihasilkan oleh fasa kuantitatif menggunakan kaedah kualitatif. Dari temu ramah mendalam, kami mendapati bahawa kecacatan meningkatkan keperluan kesihatan warga emas melalui sekatan aktiviti dalam kehidupan seharian dan kehilangan rangkaian sosial. Pendapatan mempengaruhi keperluan kesihatan mereka kerana memberi mereka kemampuan untuk menghadapi krisis kewangan, kemampuan membayar untuk keperluan peribadi dan kemampuan untuk berdikari. Pengangkutan ke fasiliti kesihatan mempengaruhi keperluan kesihatan kerana ia membuatkan mereka

mematuhi janji dan ia juga memberikan mereka kawalan terhadap keputusan mengenai pengangkutan. Pengaturan tempat tinggal mempengaruhi keperluan kesihatan kerana memenuhi kehendak warga emas untuk privasi, memungkinkan mereka melakukan aktiviti rutin mereka, dan pilihan disumbangkan oleh keakraban dengan persekitaran kejiranan dan ketersediaan jaringan sosial yang mapan. Pemilikan rumah mempengaruhi keperluan kesihatan kerana ia memberi ketenangan fikiran dan ia juga memberi mereka kemampuan untuk memberi sokongan kepada orang lain. Terakhir, perasaan jarak ke kemudahan kesihatan juga mempengaruhi keperluan kesihatan kerana ia membolehkan mereka untuk hadir ke kemudahan kesihatan tanpa didampingi. Ia bergantung kepada kepuasan mereka keatas perkhidmatan yang diberikan.

Kesimpulannya

Keperluan kesihatan warga emas di Malaysia adalah kompleks. Mekanisma disebalik semua faktor keperluan kesihatan terdiri daripada interaksi yang kompleks antara status ekonomi, fizikal, sosial, psikologi dan persekitaran warga emas penghidap kencing manis. Semua faktor saling mempengaruhi antara satu sama lain dalam membentuk keperluan kesihatan mereka

Kata Kunci: Aged, Needs and Demand, Health Services, Type 2 Diabetes, Healthy Aging

ABSTRACT

HEALTH NEEDS AMONG OLDER PEOPLE WITH DIABETES IN PENANG: A MIXED METHOD STUDY

Background

Both population aging and increasing prevalence of diabetes leads to a longer duration of having diabetes. The longer the duration of disease, the higher risk of developing complication, causing disability, and eventually reducing the quality of life. With the reduction of quality of life, health need will arise. Majority of the literature on health need among elderly with diabetes describe needs related to the services. Evidence on physical, psychological, and social health dimensions are limited. Three other dimensions which are financial, environment and spiritual have not been investigated. In addition, evidence on health service heed that is based of patient's expressed need were also lacking. It is important to fulfil these dimensions to improve quality of life, for healthy aging and to build evidence for policy on elderly with diabetes

Method

This is a mixed method study, with sequential explanatory design conducted between October 2018 to August 2020. The two-phase design began with a quantitative cross-sectional health survey, followed by qualitative interviews using phenomenology approach. The quantitative part was conducted between April 2019 and August 2019. While the qualitative part was followed simultaneously between end of August 2019 and April 2020. The survey study identified the health need and the related factors using 13-Item need for care scale developed by WHO, involving 417 randomly selected samples from government health facility in Penang, Malaysia. The scores are summarized into single mean, ranges from 1 to 5. The Phase two study used in-depth

interview, exploring the health need among those who have high to low health need based on the significant factors identified in the health survey. The 15 respondents were purposively selected samples, a subset from the phase one study

Result

For the phase one study, the health need was measured by the respondent's need for care score. The mean (SD) of overall need for care was low, 1.66 (0.66). This study found that there is significant positive linear relationship between age group, perceive distance to health facility, transport to health facility, living arrangement and disability, towards need for care. There is also significant negative linear negative relationship between Income source and need for care, [$F(11,405) = 11.01$, $p < 0.001$], with an R2 of 0.37. From the in-depth interview, disability mediates health need of the elderly through restriction in activity in daily living and loss of social network. Income mediates their health needs through better ability to face financial crisis, affordability to pay for personal need, and ability to be independent. Transport to health facility mediates health needs through the compliance to appointments and gives self-determination over decision for transport. Living arrangement mediates health needs through availability of established social network, by satisfying the elder's preference for privacy and their routine activity, and familiarity with neighbourhood environment. Home ownership mediates health needs through the peace of mind it gives and their ability to give support to others. Lastly, perceive distance to health facility also mediates health needs because it determines by their ability to attend health facility unaccompanied, and by satisfaction of the service

Conclusion

The health needs of elderly with diabetes in Malaysia is complex. The way how disability, income, transport, home ownership and perceive distance influence health needs consist of complex interaction between economic status, physical, social, psychological and environment of the elderly. All these factors intertwined with one another in shaping the health of the elderly.

CHAPTER 1

INTRODUCTION

In this chapter, an introduction to the topic will be presented, along with a summary of literature review and followed by study rationale. The chapter will begin with the presentation of the health needs of the elderly, the definitions, the dimensions and then the factors associated with the health needs, according to the available literature.

1.1 Overview of older people

Older people is defined as chronological age of people who are 65 years and above (Orimo *et al.*, 2006), or 60 years old and above, as used by the Ministry of Health Malaysia (KKM, 2018). There were 703 million elderly in the world in 2019, making up 9% of the world population. In Malaysia, the total population of elderly in 2019 was 2.2 million, making up 6.9% of its total 31 million population (United Nations, 2019). The elderly is important because globally, the population is growing faster than any other age groups. Recent evidence shows that worldwide, the number of people aged 60 and over are estimated to increase from 1.2 billion in 2025, to two billion in 2050 (Kowal *et al.*, 2010). Similar phenomenon is also taking place in Malaysia, where there is also an increase in older people population (Department of Statistic Malaysia, 2017). This country has been forecasted to be an aging nation by 2030 when 15 per cent of the population will comprise of older people (Rashid *et al.*, 2016). Penang is the third state with the highest proportion of older people in Malaysia with 10.2 percent, after Perak, 11.1 percent and Perlis, 11 percent (Hamid, 2015). The Aging

index of Penang, or the ratio of older people to 100 person below 15 years old are on average similar compared to most states in peninsular Malaysia, ranging from 25 to 50 older people for every 100 young people (Hamid, 2015; Preedy and Watson, 2010). This figure is still far lower compared to other countries like Germany, Greece, Italy, Bulgaria, and Japan that have already reached aging index more than 100 since year 2000 (Gavrilov L.A., 2003). The similar changes in age structure will soon occur in Malaysia inthe coming years. The population change will contribute to increase in years of healthy life expectancy. This is also accompanied by the increasing numbers of people living with chronic diseases and disabilities (Carmel, 2019).

1.11 Diabetes among older people

As people get older, they are more prone to develop Non-communicable disease. NCD is an important disease worldwide, that affects both morbidity and mortality of people around the world (WHO, 2012). Globally, there are 285 million people who have diabetes, and this is expected to increase to 438 million by 2030 (Shaw *et al.*, 2010). A similar scenario has been forecasted for Malaysia, where it is also estimated that the prevalence will increase from 11.6 % in 2010, to 13.8 % in 2030 (Shaw *et al.*, 2010). In 2010, the prevalence of diabetes among Malaysians was 11.8%, the highest prevalence of diabetes among all Asian countries and ranked 10th worldwide (Shaw *et al.*, 2010). In Malaysia, Diabetes is an important chronic disease for the older people due to the high prevalence and the complications that it is associated with (Ahmad Sharoni *et al.*, 2015; Rampal *et al.*, 2010). Prevalence of Diabetes in Penang for all age group in 2015 was 18.1 %, the ninth place when compared to all states in Malaysia. The total number of patients who are above60 years old who had registered in National Diabetic Registry in Penang is 32,615 (MOH, 2018b). The total population of who aged 60 years old and above is 155,911 (Aziz and Ahamd, 2017). Therefore, there

were roughly about 20.9 % of older people in Penang diagnosed with Diabetes. On top of that, they also suffer from other type of non-communicable disease. Sixty percent of older people with diabetes also have hypertension, hyperlipidaemia and COAD (Sherina *et al.*, 2004a).. If divided by racial background, the prevalence for type II Diabetes Mellitus is 42% for the Bumiputras, followed by Chinese 39%, Indian 18%, Other races 1% and foreigners 0.1% (MOH, 2018).

1.2 Older people Health Needs

Needs literally means things that someone requires to live in a comfortable way or achieve what they wanted. Bradshaw (1972) defined it as the *capacity to benefit*. In philosophical point of view, need is regarded as the foundation of reaching someone's goal (Asadi-Lari et al., 2003). Health as defined by the World Health Organisation "*is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*" (WHO, 2020). Health needs is defined as the needs that can be benefited from the services and environment that incorporate a wide social determinants of health (Wright *et al.*, 1998). Therefore, most literatures describe the domains of health needs according to WHO health domains which is physical, mental, and social wellbeing of older people. Other researcher extended the domains to include spiritual, financial and environment health need Ghasemi *et al.* (2017); (McClane, 2006) Ghasemi *et al.* (2017) further extended the domains to include service need (health care, social services, and environmental modification). . To fulfil the older people health needs, multiple health domains and every aspect of health must be fulfilled. The domains work synergistically towards the health of the older people.

1.2.1 Physical Health Need

Physical Health is an important component of older people's health and is often measured by their ability to perform activity of daily living (ADL). Older people will experience progressive functional loss that follows a typical order, as described from many studies. It starts from limitation of basic ADL to Instrumental ADL, from inability to go to toilet, to inability to perform social activity (Morris *et al.*, 2013). Other than the aging process itself, it is also worsened by factors like chronic diseases, physiological impairment, and cognitive decline (Herr *et al.*, 2013). Ambigga *et al.* (2011), Wan-Ibrahim and Zainab (2014) and Selvaratnam *et al.* (2012) highlighted that Malaysian older people suffer from multiple and complex physical health problems, that lead to functional impairment that eventually interfere with their ADL (Hairi *et al.*, 2010; Loh *et al.*, 2005; Tobi *et al.*, 2017). This decline in reserve and function across multiple physiologic systems will eventually leads to frailty. Frailty is established when someone met three out of five criteria: low grip strength, low energy, slowed waking speed, low physical activity, and/or unintentional weight loss. Medical condition that is commonly associated with frailty are sarcopenia, osteoporosis and muscle weakness (Xue, 2011). This is also further aggravated by other factors such as socio-demography and environmental factor. Older people are also at risk of having nutritional deficiency. Mean energy intake for Malaysian older people were lower than the requirement (Shahar *et al.*, 2000; Suriah *et al.*, 1996) and this is compounded by micronutrient deficiency (Lai Kuan *et al.*, 2009).

1.2.2 Mental Health Need

Mental health is also an important factor that affects the health of an older person. Literatures have shown that the increase in morbidity and mortality of the older people

are related to common mental disorders in the older people patients (Parkar, 2015). Worldwide, an estimated of 15% of older people suffer from mental disorders (WHO, 2017b). Among them, depression is the most common, affecting 7% of the world's older people population; followed by dementia 5%, anxiety disorders 3.8%, and substance abuse 1% (Parkar, 2015; WHO, 2017b). Similar situation also occurs in Malaysia, where depression is also the most common mental health problems, followed by cognitive impairments (Sherina *et al.*, 2003). The prevalence of depression among the community dwelling older people in Malaysia is also comparable with the WHO data, ranging from 6.3 to 13.9 % (Rashid and Tahir, 2015). Older people are at risk of depression, contributed by death of partner and loneliness (Golden *et al.*, 2009; Wan Mohd Azam *et al.*, 2013).

There are several factors that also influence mental health of older people. There are economic factors, environment, mobility, and phycological condition. Depression is related to the economic status of the older people through the ability to provide for themselves. This is evidenced by the finding of a study, which shows that the highest prevalence of depression reported in Malaysia are among older people receiving aid in Penang, where 75.3 % reported to have mild and severe depression. The aid receivers are among older people who are from below the poverty line (Rashid and Tahir, 2015). Environmental factor also contributed to depression of the older people. Village setting often has better social connectedness compared to urban area and this positively influence mental wellbeing of older people It has been proven that village setting often shows lower rate of depression (Nur Aqlili Riana *et al.*, 2018; Sherina *et al.*, 2003).. Psychological health also has an impact on physical health and vice versa. Reduction in physical health often leads to disability, and mobility restriction is one of the impacts, that contributes to depression (Chen *et al.*, 2016; Ravulaparthy *et al.*,

2013). Depression is also more likely to develop among older people who suffer from multiple chronic diseases. Medical constraints restrict the elder's ability to participate in social and leisure activities, thus may also lead to depression (Ravulaparthy *et al.*, 2013). Cognitive impairment is the second most common after depression, and frequently characterized by memory loss or dementia. The prevalence ranged from 11 to 34%. The estimated prevalence by researchers, from different studies are around 11% for Malays (Rashid *et al.*, 2012), 23% among indigenous groups of Sarawak (Pu'un *et al.*, 2014), 22% among rural older people (Sherina *et al.*, 2004b), and 21.1% among urban older people (Lee *et al.*, 2012). The highest prevalence reported was in government nursing home at 36.5 % (Al-Jawad *et al.*, 2007). With cognitive impairment, older people will have a specific need.

1.2.3 Social Health Need

Social health is a health dimensions that concerns on how individuals interact with social environment. It focuses on relationships within family, social groups, and the community. Interference in social health dimensions will lead to conditions such as loneliness and social isolation, which increase the health needs of an individual (Ghasemi *et al.*, 2017) Older people's need for social health is unique because of the changes they face in their social life that are caused by retirement, family change, and role reversal (Garrett, 1987). Once they retire, older people lost their previous social connection and social position. The changes happen within their community and family, where the older people became dependent on their adult children as they aged. At a community level, the older people may be in younger years have played supportive roles for example as a policeman or political leaders, but as they retired, they require the community to support them back. Social health depends on few

factors, such as social network quality and interpersonal communication. Both can be achieved by social participation through social activity, such as leisure activity, hobbies, and religious activity (Carlson *et al.*, 2011; Castel *et al.*, 2008; DONALDSON *et al.*, 2015). Ravulaparthy *et al.* (2013) has highlighted the importance of social activity towards life satisfaction and happiness of the older people. Social activity contributed to good social relation and eventually will provide a strong social network for the older people. It is contributed by engagement in activity of interest (Dahlan *et al.*, 2014). To achieve meaningful social relation, Malaysian older people participate in leisure activity (Minhat, 2014; Sajin *et al.*, 2016), religious activity (Zainab *et al.*, 2012) and physical activity (Manaf, 2013). Social networks are known to have positive impact for older people's well-being (Wright, 2016; Zhang *et al.*, 2019). A good social network function as a channel for the exchange and flow of social resources. Bigger social network contributes to greater social integration and reduce social isolation. It also increases access to social capital resources that are embedded within the network (Zhang *et al.*, 2019). Loneliness is the subjective experience of social isolation, where older people feel that their desire of companionship is unmet. They feel isolated even in company (Golden *et al.*, 2009). It is a risk factor for both mental health and physical problems, and often associated with widowhood (Davies *et al.*, 2016). Feelings of loneliness among older people is also attributable to increasing functional disability and decreasing social contact (Yeh and Lo, 2004). Enhancing social support can improve the health of older people (Rechel *et al.*, 2009). Support frequently involves the provision of practical help such as assistance with activities of daily living (ADLs) and emotional support either by family or informal caregiver (Shahar *et al.*, 2001; Suzana *et al.*, 2002). Giving support can reinforce role identities and promote well-being of older people. Receiving support

from spouse and siblings are fine due to the clear role of helping one another, but receiving support from children will reduce their sense of independence by leaning on their children who had previously relied on them (Thomas, 2009). It either promote a sense of self-efficacy and increase self-esteem or become disabling (Williams *et al.*, 2017). Therefore, social support can have mixed effects. The concept of interdependency is important within the elder's family. Interdependency is a shared dependence or the action of being joined with a common bond through the exchange of giving and receiving support (Makhtar *et al.*, 2016; Mutalib *et al.*, 2016). Interdependencies can be among spouses (Momtaz *et al.*, 2013), between children and parents (Ng and Hamid, 2013), between grandparent and grandchildren (Jo-Pei and Rahimah, 2011) and between elder and the community (Mutalib *et al.*, 2017). It ranges from instrumental and emotional support to income provision. All the studies concluded that interdependence could improve older people's quality of life.

1.2.4 Environmental Health Need

Environmental health focuses on safety and security of the person, the residential area, and the community, and can be divided into physical and social environment. Interference, for example within physical environment, such as unsafe residential area may lead to fall among elderly and restrict their mobility. This is because that theirspatial needs are more demanding. They need safe crossing points, resting places, and an even pavement surfaces (Böcker *et al.*, 2017). The important role of environments in determining health and well-being of older people has been described by many studies (Lai *et al.*, 2016; Tiraphat *et al.*, 2017; Yu *et al.*, 2019). To adapt with the reduction of function, the environment where the older people live in needs to be designed to support their daily life. Therefore, age friendly environment is important

to promote the elders to be independent. They need support in their daily life, particularly in public places due to their physical and cognitive impairment. Positive impacts of age-friendly environment towards process health optimization have been described in many studies (Lai *et al.*, 2016). Age-friendly environment needs cooperation from all sectors, which includes transportation, housing, community and health services, outdoor spaces, and building. Physical environment can be divided into residential and public environment. The physical environment of the public spaces, such as walkway and housing arrangement, influence social cohesion, physical activity, mobility, and safety of the older people (Elsawahli and Ali, 2017). Environments influence the mobility of older people through urban environment and transportation that meet the need of the older people. Transportation is also needed for older people to be involved in their social activities (Ravulaparthy *et al.*, 2013). Thus, transportation restriction can contribute to social exclusion (Titheridge *et al.*, 2009). Home environment is also important for older people. It is largely contributed by living arrangement and home ownership. Living arrangement is important in determining support system, life satisfaction and health (Waite and Hughes, 1999). Malaysian older people prefer to live with their children and expected their children to care for them (Alavi *et al.*, 2011a). Co-residence between adult children and elder parents were common in the ninety's (DaVanzo and Chan, 1994). After few decades, the figure does not change much. Few other latest studies reported findings where living with children is still the most common type of living arrangement among older people (Alavi *et al.*, 2011b; Kooshiar *et al.*, 2012b; Mohd *et al.*, 2016; Norliati, 2016), especially among Malays (Evans *et al.*, 2018). Comparing with other countries, almost similar pattern can be seen. In Taiwan, those from higher socioeconomic status prefer either independent living arrangements or co-residence with their children. Older people with

more family resources, such as large family size, prefer to co-reside with their children. Only older people with adequate social support and/or contact networks prefer independent living arrangements (Chen and Chen, 2012). However, some still prefer to live by themselves. A finding in Taiwan found that provided that older people have financial resources, those in poor health are more likely than those in fair health to prefer to live by themselves (Kim and Rhee, 1997). This is also supported by another Taiwanese study concluded that older people with self-reported poor health tend not to co-reside with children in order not to be a burden (Chen and Chen, 2012).

1.2.5 Financial Need

Once someone retire, they also lose their social status, social role, companionship, and their former lifestyle (Garrett, 1987). These losses often lead to reduction of income, and further leads to financial strain (Angel *et al.*, 2003; Ferraro and Su, 1999) Older people in Malaysia experience same phenomenon where they have been proven to be at risk of poverty (Masud and Haron, 2008; Mohd, 2014; Mohd *et al.*, 2018; Parsa, 2008). Older people depend on both formal and informal protection of their financial security. However, formal protection such as pension and EPF were proven not enough. To maintain their lifestyle, they must earn at least sixty to eighty percent of their previous income. The current pension scheme only provides thirty to forty percent of their previous income (Jamaluddin and Wah, 2013). Similar for Employees Provident Fund (EPF) , where it is also proven to be inadequate (Caraher, 2000). The poor financial implications of retirement for the older people, particularly upon reliance towards formal protection have been well described (Asher, 2001; Foziah *et al.*, 2018; Hassan and Othman, 2018; Vaghefi *et al.*, 2017). As a result, informal protections such as insurance, savings and family support are important sources of

additional income (Mohd, 2010). However, there are also challenges in income provision through family members. Impact of westernisation and economic change towards younger generation erodes familial support and filial piety (Caraher, 2000). As a result, the children play less part in taking care of their parents. Due to the inadequate income, the older people in Malaysia are forced to remain in some form of employment. Malaysia's labour force participation rate for the 60 to 64-year-old is estimated to be about 98%, while the employment rate of older people in the same category is only 2.5%. For one, they automatically lose their jobs once they reach retirement age, despite their ability and willingness to continue working, and people just assumed they have saved up enough funds to last their retirement years (Jamaluddin and Wah, 2013). There were also negative attitudes associated with older people disability (Kampfe *et al.*, 2008). This is partly contributed by lack of suitable policy for recruiting and retaining older people worker (Chan Yin-Fah, 2010). For those who havedifficulty to meet their financial need, they experienced financial restrain. It is a specific stressor associated with the subjective sense that one's income is inadequate. It is a strong predictor of health and can undermine ability to care of themselves (Angel *et al.*, 2003).

1.2.6 Health need for older people with Diabetes

Combined with increase in aging population, this caused them to live with the disease for a longer period. The longer the duration of diabetes, the higher their chances to develop complication. Older people also are more likely to have poor control over their diabetes and this worsen the complication (Stokes *et al.*, 2017). This complication will be resulted in reduced function, for example physical disability and this will affect their quality of life. Specific need will arise due to the impairment in quality of life, and if it is not fulfilled, it will further reduce their quality of life.

Most literatures regarding health needs among elderly with diabetes focus on the service need, followed by mental health and physical need. For service need, the evidences comprise of two types, which are health service and social service.

Within health service need, the evidences described regarding need for readable health information and the need for information regarding their medication, food preparation and access to resources and services that might help them (Carolan-Olah *et al.*, 2013; Petterson *et al.*, 1994). Older people were also often misinformed by the nutritional information in the television, hearsays from their friends, and food taboos. Therefore, they need people with authority to clarify the information (Herne, 1995; Lin and Lee, 2005; Medeiros *et al.*, 1991). There were also evidences regarding the need for screening, diagnosis, and treatment (Stokes *et al.*, 2017). Due to multisystem involvement, treatment needs require multidisciplinary approach (Singh *et al.*, 1999). The need for optimization of diabetic control through clinical management also has been widely studied (Andrews and O'Malley, 2014; Bramlage *et al.*, 2012; Greiner *et al.*, 2014). Literature also described regarding two types of treatment need for elderly with diabetes, which is the need determined by healthcare provider and need expressed by the patients. Needs determined by healthcare provider are the types of health need that were defined by the clinical judgement, which is the medication and other related services given in the health facility, such as eye screening and dental checkup that suits the patient's current condition (Dekker *et al.*, 2017). This is based on treatment protocol or clinical practice guideline (Levy, 2009; Stokes *et al.*, 2017). The expressed need, on the other hand deals with patient's point of view towards acceptability, affordability and accessibility of the services provided (Chen and Hou, 2002). With regards to the social service, need for daily life and self-care support are the most

important (Miyawaki *et al.*, 2016). The social services that they need are social work-related services such as home help and support for transportation (Lee, 2007). Evidences on physical and mental health among elderly with diabetes were limited. The available evidences within these domains were regarding depression and prevention of fall among elderly with diabetes (Trief, 2007)

1.3 Factors associated with unmet health need

There are several factors contributing towards unmet health needs. The factors can be categorised into:

1.3.1 Socioeconomic status

Socioeconomic status is a combination of economic and sociological measure of a person and include their family's economic and social position in relation to others, based on income, education, occupation and residential location (Rajda and George, 2009). Social and economic status has long been related to health, where those higher in the social hierarchy typically enjoy better health than those below (Adler *et al.*, 1994). Economic status also is an important source of health inequity, where the poor who tend to have poorer health and that there is a continual gradient, from the top to the bottom, following the socio-economic ladder (Bradley and Corwyn, 2002). Social and economic status influences the health need among older people. For example, those who belongs to low level of former employment often has unmet health need (Herr *et al.*, 2013). This is because being in higher social status enable them to navigate through the health service and benefited from it. Despite the social status, income on its own has a big influence towards health need (Diamant *et al.*, 2004; Hwang and

Choi, 2015; Shi and Stevens, 2005). Those who experience economic hardship has twice the risk of having unmet health need (Kim *et al.*, 2018).

1.3.2 Accessibility and availability to medical services

Accessibility is the outcome of the design of products, devices, services, or environments for people. Those that are important for the older people included local services and amenities such as transportation, community health clinics, and recreational facilities. It can be viewed as the ability to access and benefited from it (Henry *et al.*, 2014). Lack of access to existing services is one of the major factors associated with dissatisfaction. Studies on health needs therefore give information on the availability and accessibility of services in respect to local settings (Tan, 2015). If services are not accessible, they will not be used despite being needed (Sibley and Glazier, 2009). Availability of the services is the utmost important factor in determining whether the needed services are fulfilled. In Canada, it is found to be as the most common category of reasons for unmet need (Sibley and Glazier, 2009). Older people make twice the number of medical trips (Titheridge *et al.*, 2009). Malaysian older people also frequently utilize medical services and the utilization increases with the patient's age (NoorAni *et al.*, 2018). Access to medical service is related to transport (Chen *et al.*, 2016). Therefore those who have access to transport has better quality of life compared to those who do not (Ravulaparthy *et al.*, 2013).

1.3.3 Living arrangement

Living arrangement is an arrangement that allows people to coexist. It is usually characterized by the relationships of a person to other people with whom they usually reside. It can be familial relationship, non-familial relationship or usual residence

(Knodel and Chayovan, 1997). Living arrangement is an important factor influencing health need among older people, it can both increase or decrease health needs of the individual.

This is supported by Op Reimer *et al.* (1999) who mentioned that older people who have unmet need often live alone. Couples or immediate family members who live with older people can become the protective factor for unmet health need (Diamant *et al.*, 2004; Herr *et al.*, 2013). In Malaysia, living only with a spouse, followed by co-residency with children were both associated with better life satisfaction and better social support function for the older people (Kooshiar *et al.*, 2012a). The more demanding the household the higher health need of older people. Demanding type of living arrangement means that it is the situation they live, where it demanded them to be on their own and not supportive. Living with spouse is known as the least demanded living arrangement, followed by with children and a complex household. Married couples living together show the highest levels of physical and psychological functioning, followed by married couples living with children, and lastly single older people living in complex households (Waite and Hughes, 1999).

1.3.4 Home ownership

Living in their own house contributed to lower rates of unmet need. Older people in Malaysia prefer to live in their own house (Aini *et al.*, 2016b). Majority of older people in United States also want to remain in their homes as they get older (Hagen, 2013). This concept is known as aging in place. Thus, home ownership is important. There is evidence that people who own their own houses are in better health than people who rent their houses, even controlling for income. Owning a house gives a peace of mind to the owner, because it gives them autonomy, social status, and sense of security

(Howden-Chapman *et al.*, 2011). However, living in their own home but with limited mobility might also pose risk for unmet health need (Herr *et al.*, 2013).

1.3.5 Age

Older people can be categorised into young old (60-74), old (75-84) , old-old (85-94), and oldest-old (95+) (Cohen-Mansfield *et al.*, 2013). The difference in health needs among old and older old are often highlighted (McMurdo, 2000). This is because the older the person becomes, the more likely they are to have unmet health needs (Op Reimer *et al.*, 1999). It is supported by other studies that unmet health needs increases with age (Herr *et al.*, 2013; Kshetri and Smith, 2011). In a study of people aged more than 70 years involving 2350 respondents in France, age was the main factor associated with unmet health care needs (Herr *et al.*, 2013).

1.3.6 Gender

To fully understand ageing and health, gender perspective is required. There were differences between the health need between both genders, as a result from both biological and sociological construct of being men or women. For many centuries, women have had lower levels of education, lower employment and lower income compared to men. Despite the increase in education and employment in recent years, female seniors still belong to that group. The causal relationship between education and income towards poor health has often been reported in the literature (Carmel, 2019). Men and women suffer from the same health problems, but the frequency and progression distinguish them (Dhar, 2001). Some specific diseases differ between gender as it results from physiological differences. In pertaining for healthcare, women may demand less due to difficulties in gaining access, especially in developing

countries (WHO, 2017a). Therefore they tend to have higher rates of unmet need for health care (Diamant *et al.*, 2004). Differences can be seen in marital status where it has been found being married was more protective for men's health than women's (Williams *et al.*, 2017). Men also are less able to cope to widowhood, where they suffer more loneliness than women when living alone (Mouodi *et al.*, 2016).

1.3.7 Disability

Disability increase the risk of having unmet health needs (Herr *et al.*, 2013). Disability has often been defined as a physical, mental, or psychological condition that limits a person's activities (Mont, 2007). The interaction of a person's functional status with environments give rise to disability. If the environment is well designed, people with functional limitations would not be disabled (WHO, 2001). The domains of disability consist of body structure and function, activities and participation (Manini, 2011). Body structure and function are important to the older people because physical disability is an important issue for them. Older people are known to suffer from various physical changes because of growing old. Most of the physical disabilities in older people result from a progressive loss of function (Nagi, 1976). Once the older people have disability, they often have more complex need and are more likely to be unmet (Herr *et al.*, 2013; Op Reimer *et al.*, 1999).

1.3.8 Marital status

The positive association of marital status towards health of the older people have been described by many studies (Goldman *et al.*, 1995; Gutiérrez-Vega *et al.*, 2018; Perkins *et al.*, 2016; Williams *et al.*, 2017; Zheng and Thomas, 2013). Marriage were known to facilitate access to health information and services, reduce risk-taking behaviour

and encourage healthy behaviour. It also helps to face stressful situations, became main source of informal health care, and provide economic resources (Williams *et al.*, 2017). Married persons have better physical and psychological health, have fewer healthcare need, and experience lower death rates than single, widowed, and divorced persons (Goldman *et al.*, 1995; Gutiérrez-Vega *et al.*, 2018). Without a partner, older people will face a consequential impact for their health and emotional well-being, especially for those becoming widowed or divorced (Perkins *et al.*, 2016; Williams *et al.*, 2017). However, there are contradictive studies. Being married or not is not a significant predictor of quality of life for older people who receive social aid in Penang, Malaysia (Khan and Tahir, 2014). The explanation perhaps lies on the fact that the protective effect of marriage also contributed by the quality, duration, gender, age, and cultural context (Zhu and Gu, 2010). Psychological account and time factor also play a role. But married people tend to overestimate their health. They have positive perception towards their health and often reported their health to be good (Zheng and Thomas, 2013).

1.3.9 Education

A higher educational attainment has been associated with better health (Baker *et al.*, 2011; Cutler and Lleras-Muney, 2006; Williams *et al.*, 2017). It improves health directly and indirectly through work and economic conditions, financial well-being, social resources, health information and healthy lifestyle (Carmel, 2019; Cutler and Lleras-Muney, 2006). It is believed to be a primary driving force behind the social stratification of health (Shaw and Spokane, 2008). Educational status affects the ability of the older people to understand information about their disease and the instructions by health personnel in managing their health , that contributed by literacy. (Rajda and George, 2009). Literacy also enables elders to have access to health information.

However, education only reflects years of formal education, but does not measure literacy. Literacy is affected by lifelong learning and age-related declines, and proved to be more important for older people than educational status (Carmel, 2019). It has been described that the effect of education can only be seen for primary and secondary schools. There was no additional health benefit associated with the completion of a degree. The effect of education towards health also starts to fall sometime between ages 50 and 60, therefore education may matter less for the older people (Cutler and Lleras-Muney, 2006).

1.4 Study Rational

Due to both aging population and increasing diabetes prevalence, it leads to longer duration of the disease. The longer the duration of a disease, the higher the risk of developing complication, and this will further lead to reduce in function. Without intervention, reduction in function will lead to disability, and will reduce their quality of life, and health need will arise. It is unknown whether health need of elderly with diabetes in Malaysia is being fulfilled. With regards to the health service need, most of the evidences focuses on the needs determined by the health provider. There is lack of evidence regarding expressed need by patients. Most literature focuses on the service dimensions, and some discuss regarding physical, mental and environment. Evidence regarding other dimensions of health need for elderly with diabetes, that includes financial, social, and spiritual health is lacking. Fulfilling all dimensions are important to improve quality of life, for healthy aging. It is also important to build evidence for policy on elderly with diabetes

1.5 Research Questions

1. What is the level of health need among older people with DM in Penang?
2. What are the factors related to the level of health need among older people with DM in Penang?
3. What are the health needs among diabetic older people in Penang?

1.6 Objective of the study

1.6.1 General objective

To determine the level of, and factors associated with, and to further explore the health needs among older people with diabetes.

1.6.2 Specific Objective

1. To measure the level of health need among older people with diabetes in Penang.
2. To determine factors related to level of health need among older people with diabetes in Penang.
3. To explore the health need among older people diabetics in Penang.

1.7 Research Hypothesis

There are significant association between the factors and health need among older people with diabetes.

1.8 Conceptual Framework

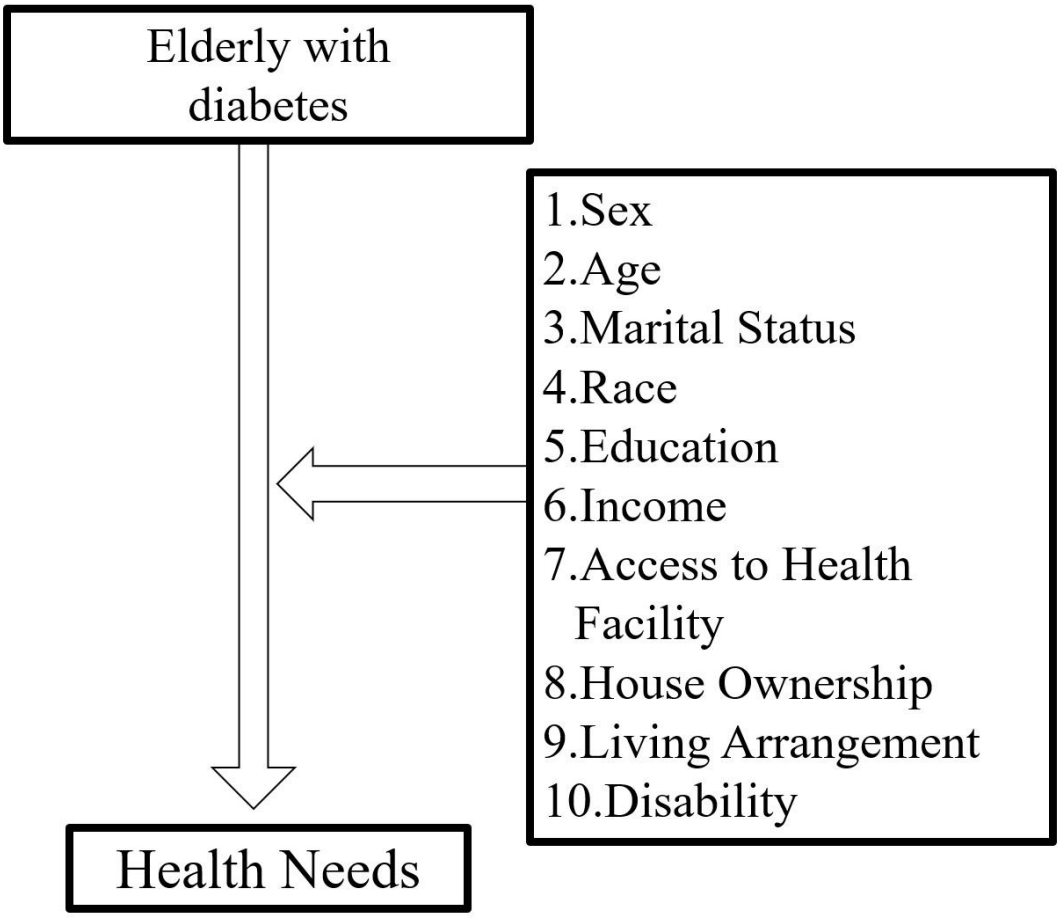

Figure 1.1: Conceptual framework of the study

This conceptual framework explains the relationship between elderly with diabetes towards health need. The factors include socio-demography, economy, educational status, access to health facility, home ownership, living arrangement and disability towards health needs of diabetic older people.

CHAPTER 2

METHODOLOGY

2.1 Research Design

This is a mixed method study, with sequential explanatory design. The two-phase design began with the collection and analysis of quantitative data, followed by subsequent collection and analysis of qualitative interviews using phenomenology approach (Creswell & Plano Clark, 2011). The Phase 1 of this study used cross-sectional study to identify the health need and factors associated with the health need among older people with diabetes in Penang. The Phase 2 study involves qualitative approach, exploring the health need among older people diabetes patients who belong in high to low health need, derived from the same sample from the Phase 1 study.

2.2 Study duration

The whole study was conducted over a period of twenty-two months between October 2018 to August 2020; from the proposal presentation until viva defence. The quantitative part was conducted between April 2019 and August 2019. While the qualitative part was followed simultaneously between end of August 2019 and August 2020.

2.3 Study Area

Penang is a Malaysian state located in the northwest coast of peninsular Malaysia, by the Malacca strait. Located in north-western peninsular Malaysia, this state is divided

into two parts; island dan mainland, which is Seberang Perai, separated by the Straits of Malacca. Seberang Perai is bordered to Kedah in the east, and Perak in the south. This state consists of five districts, which are the Northeast Penang Island, Southwest Penang Island, North Seberang Perai, Central Seberang Perai, and South Seberang Perai. It is among the most urbanized states with urbanization level of 90.8 percent, after W. P. Kuala Lumpur and W. P. Putrajaya with 100 per cent level in urbanization, and Selangor with 91.4 percent (Department of Statistic Malaysia, 2011). It consists of a largely urban areas which include Georgetown, Bayan Lepas, Butterworth, and a small number of rural areas such as Balik Pulau and Sungai Acheh. Penang's population stood at nearly 1.767 million and has a high population density with 1,684 people for every square kilometre (DOSM, 2017). There are 42 percent Bumiputras, 39 percent Chinese, 10 percent Indian and 9 percent non-Malaysian citizen (Penang Institute, 2019) . Pertaining to older people population, Chinese constitutes themajority of Penang older people population, with 60 percent followed by Bumiputras 29 percent, Indian 9 percent, non-Malaysian 2% and other ethnic 0.1% (Penang Institute, 2014). Malay and English are commonly used by the Penangites, and studies have shown that 98% of adult Chinese are able to communicate in combination of Malay and English, along with Hookean and Cantonese (Nicholas and Wales, 2010).

2.4 Phase 1: Cross-sectional Study

2.4.1 Reference population

Older people with type 2 diabetes in Penang

2.4.2 Source population

Elderly diabetes who attended government health facility

2.4.3 Study criteria

2.4.3.1 Inclusion criteria

1. Older people aged 60 years old and above who stayed in community
2. Known diabetes type 2 as noted in Diabetes register, diagnosed as least 1 year from date of interview

2.4.3.2 Exclusion criteria

1. Institutionalised older people
2. Immobile
3. Poor mental status
4. Not able to communicate in Malay or English

2.4.4 Sample size determination

The sample size calculation done in accordance with the objectives.

Objective 1

To identify mean level of health need among older people diabetic in Penang calculated using single mean formula (Najib, 2015).

Standard deviation of population, σ = standard deviation of sampling distribution x $\sqrt{N}$, where SD for need for care scale for previous study using Malaysian population is 0.72, with 447 samples (Mohamad Yunus *et al.*, 2017). Therefore,

$\sigma = 0.72 \times \sqrt{447}$

$\sigma = 15.2$