KNOWLEDGE AND BEHAVIOUR TOWARDS SALT INTAKE AMONG ADULT PATIENTS GETTING TREATMENT IN OUTPATIENTS CLINIC HOSPITAL USM

by

FARAH SYAZWANI BINTI HILMY ZAKI

Dissertation submitted in partial fulfillment of the requirements for the Degree of Bachelor of Health Science (Nursing)

June 2016

ACKNOWLEDGEMENT

In the name of Allah SWT the Most Gracious and Most Merciful, I am very grateful for my strength from Allah SWT in order to complete this research project. I am thankful for the physical health and emotional stability given by Allah SWT throughout the research time frame. I am also deeply thankful to my supervisor, Mrs Rosmawati Mohamed for her belief in me, guidance and good criticisms with encouragements during the research project.

I also appreciates the course coordinator for this research project, Dr Dariah Mohd Yusoff for her support and generous sharing of experiences of her researches. A very special thanks goes to the staffs and patients of Outpatients Clinic Hospital USM and Diabetes Clinic Hospital USM for their open hands in receiving me and this study. Their co-operative ways has opened many doors of knowledge and observations, thus helping me in this research.

Next, I would love to thank my mother and my late father, for raising and educating me well enough to understand the importance of education. Their blessings made a major part in me, as a motivation to complete this research. Last but not least, I want to convey love towards my siblings and friends for being the factors of success for me and this research.

TABLE OF CONTENTS

CHAPTER 3 : RESEARCH METHODOLOGY

CHAPTER 4 : RESULTS

CHAPTER 5 : DISCUSSION

CHAPTER 6 : CONCLUSION, RECOMMENDATIONS AND IMPLICATIONS

PAGES

LIST OF FIGURES

PAGES

LIST OF TABLES

CONTINUE

PAGES

LIST OF TABLES

LIST OF ABBREVIATIONS

AHA	American Heart Association
CALDTE	Cambridge Advanced Learner's Dictionary Third Edition
DASH	Dietary Approaches To Stop Hypertension
DALY	Disability Adjusted Life Years
DNPCD	Diet, Nutrition and the Prevention of Chronic Diseases
FAO	Food and Agriculture Organization of United Nation
HWHW	Harvard Women's Health Watch
IOM	Institute of Medicine
NHMS	National Health and Morbidity Survey
PAHO	Pan American Health Organization
% DI	Percentage Daily Intake
SACN	Scientific Advisory Committee on Nutrition
SMASH	Shandong Ministry of Health Action on Salt and Health
SPSS	Statistical Package for Social Science
WASH	World Action on Salt and Health
WHO	World Health Organization

Farah Syazwani Binti Hilmy Zaki[1], Yvonne-Tee Get Bee[2] & Rosmawati Mohamed[3]

[1]*Undergraduate Student, Nursing Programme, School of Health Sciences, Health Campus, Universiti Sains Malaysia, KubangKerian, Kelantan.*

[2]*Senior Lecturer, Biomedicine Programme, School of Health Sciences, Health Campus, Universiti Sains Malaysia, KubangKerian, Kelantan.*

[3]*Senior Lecturer, Nursing Programme, School of Health Sciences, Health Campus, Universiti Sains Malaysia, KubangKerian, Kelantan.*

KNOWLEDGE AND BEHAVIOUR TOWARDS SALT INTAKE AMONG ADULT PATIENTS GETTING TREATMENT IN OUTPATIENTS CLINIC HOSPITAL USM

ABSTRACT

Sodium chloride (salt) is widely used in people's food as an additive or preservatives to make food tastes better and lasts longer. The knowledge and behaviour towards sodium chloride (salt) intake has become a question mark. The aim of this study is to determine the knowledge and behaviour towards sodium chloride (salt) intake among adult patients getting treatment in Outpatients Clinic Hospital USM. A cross-sectional study was conducted on 186 adult patients getting treatment at Outpatients Clinic Hospital USM, using convenience sampling. A pilot study was conducted using Pan American Health Organization (PAHO) questionnaires. The questions contains dichotomous and Likert scale questions types, thus yielded higher Standardized Items Chronbach's Alpha compared to Chronbach's Alpha. Knowledge towards sodium chloride (salt) intake yielded Standardized Items Chonbach's Alpha of 0.520 and Chronbach's Alpha of 0.387. Behaviour towards sodium chloride (salt) intake yielded Standardized Items Chonbach's Alpha of 0.519 and Chronbach's Alpha of 0.394. There was no significant association between knowledge and behaviour towards sodium chloride (salt) intake using independent t-test, *p*-value=0.136. However, there is a significant association between knowledge towards sodium chloride (salt) intake with education level using One Way ANOVA, p-value=0.002, and there is a significant association between knowledge towards sodium chloride (salt) intake with gender using Independent t-test, p-value=0.012. In conclusion, the findings showed that knowledge and behavior does not affect the intake of sodium chloride (salt) and future research with larger sample size should be conducted.

Keywords: Knowledge, Behavior, Salt Intake.

Farah Syazwani Binti Hilmy Zaki[1], Yvonne-Tee Get Bee[2] & Rosmawati Mohamed[3]

[1]Pelajar Siswazah, Program Kejururawatan, Pusat Pengajian Sains Kesihatan, Kampus Kesihatan, Universiti Sains Malaysia, KubangKerian, Kelantan.

[2]Pensyarah Kanan, Program Biomedik, Pusat Pengajian Sains Kesihatan, Kampus Kesihatan, Universiti Sains Malaysia, KubangKerian, Kelantan.

[3] Pensyarah Kanan, Program Kejururawatan, Pusat Pengajian Sains Kesihatan, Kampus Kesihatan, Universiti Sains Malaysia, KubangKerian, Kelantan

PENGETAHUAN DAN TINGKAH LAKU TERHADAP PENGAMBILAN GARAM DALAM KALANGAN PESAKIT DEWASA MENGUNJUNGI KLINIK RAWATAN KELUARGA HOSPITAL USM

ABSTRAK

Natrium klorida (garam) digunakan secara meluas dalam makanan manusia di seluruh dunia sebagai penambah perisa dan bahan pengawet untuk menjadikan makanan lebih sedap dan tahan lama. Pengetahuan dan tingkah laku terhadap pengambilan natrium klorida (garam) telah menjadi satu tanda tanya. Tujuan kajian ini adalah untuk menentukan pengetahuan dan tingkah laku terhadap pengambilan natrium klorida (garam) dalam kalangan pesakit dewasa mendapatkan rawatan di Klinik Rawatan Keluarga Hospital USM. Kajian keratan rentas ini telah dilakukan ke atas 186 pesakit dewasa yang mendapatkan rawatan di Klinik Rawatan Keluarga Hospital USM, menggunakan persampelan mudah. Sebuah kajian perintis telah dijalankan menggunakan boring soal-selidik Pan American Health Organization (PAHO). Borang soal selidik ini mengandungi jenis soalan dua pilihan jawapan dan soalan dengan skala Likert, yang menyumbang kepada Chronbach Alpha Bahan Distandardkan yang lebih tinggi berbanding Chronbach Alpha. Pengetahuan terhadap pengambilan (natrium klorida) garam mempunyai Chronbach Alpha Bahan Distandardkan 0.520 dan Chronbach Alpha 0.387. Tingkah laku terhadap pengambilan (natrium klorida) garam mempunyai Chronbach Alpha Bahan Distandardkan 0.519 dan Chronbach Alpha 0.394. Tidak terdapat perkaitan signifikan di antara pengetahuan dan tingkah laku terhadap pengambilan natrium klorida (garam) menggunakan Ujian T, *p*-value=0.136. Bagaimanapun, terdapat perkaitan signifikan di antara pengetahuan terhadap pengambilan natrium klorida (garam) dan tahap pendidikan menggunakan ANOVA Satu Arah,*p*-value=0.002 dan terdapat perkaitan signifikan di antara pengetahuan terhadap

pengambilan natrium klorida (garam) dan jantina menggunakan Ujian T,*p*-value=0.012. Kesimpulannya, temuan menunjukkan pengetahuan dan tingkah laku tidak mempengaruhi pengambilan natrium klorida (garam) dan kajian pada masa depan dengan saiz sampel yang lebih besar perlu dijalankan.

Kata Kunci: Pengetahuan, Tingkah Laku, Pengambilan Garam.

CHAPTER 1

INTRODUCTION

1.1 Background of The Study

Sodium chloride (salt) intake is important in bodily functions such as improving insulin sensitivity, lowering sympathetic nervous system and rennin-angiotension-aldosterone effects and in consequence to that decreasing mortality and morbidity risks especially in cardiovascular disease patients (Garg, Williams, Hurwitz, Brown and Hopkins, 2011). Soupart and Decaux, (1996) stated in their study that sodium chloride (salt) in food is crucial to the body in moderate amount to prevent seizure, respiratory arrest and coma. However, some people are at risk of hyponatremia (reduced serum sodium) including menstrual women, hypoxic and young people.

According to WHO, (2006) 1 gram of sodium chloride (salt) is equal to 17.1 milimolar or 393.4 mg of sodium intake. Sodium chloride (salt) is an essential nutrient necessary for maintenance of plasma volume, acid-base balance, transmission of nerve impulses and normal cell functions (Aburto, Ziolkovska, Hooper, Elliott, Capuccio and Meerpohl, 2013). However, excessive sodium chloride (salt) intake in community is associated with wide range of opinions from various studies and journals.

Cogswell, Mugavero, Bowman and Frieden, (2016) stated that countries with successful public interventions for reducing sodium chloride (salt) in food consumed by it's populations shows reduction in high blood pressure and cardiovascular diseases occurrences. This is a strong evidence of a linear, dose-response sodium chloride (salt) effect on blood pressure. The measurement of sodium chloride (salt) intake is also important as it is impossible for individuals to plan their daily intake when the processed food already has certain amount of sodium chloride (salt) in it.

A study in the sentinel countries of the Americas (Argentina, Canada, Chile, Costa Rica and Ecuador) by Claro, Linders, Ricardo, Legetic and Campbell, (2012) found that almost 90% of respondents associated excessive intake of sodium chloride (salt) with the occurrences of adverse health conditions, with more than 60% indicated trying to reduce their current intake of sodium chloride (salt) and more than 30% of them believed that reducing dietary sodium chloride (salt) to be highly important. In addition to that, three-quarters of participants (74%) declared that they did not know the existence of a recommended maximum value of sodium chloride (salt) intake, and only half of them (47%) declared they knew the content of sodium chloride (salt) in food items.

Sodium chloride (salt) reduction resulted in significant decrease (23%) of cardiovascular events at longest follow ups among 5912 hypertensive and normal blood pressure participants in six studies (Cogswell et al., 2016). The other experiment conducted on chimpanzees using an experimental group of altered sodium chloride (salt) content in their food and control group proves that diet high in sodium chloride (salt) does increase the systolic blood pressure levels (Jiang and Whelton, 2011).

Centers for Disease Control and Prevention report had cited Institute of Medicine (IOM) as putting upper intake of daily sodium chloride (salt) as a teaspoon of sodium chloride (salt) per day (5.8 grams of salt) which contains sodium of 2300mg / day, as the recommended sodium chloride (salt) intake for adults aged 19 and above (Carriquiry, Moshfegh, Steinfeldt, Cogswell, Loustalot, Zhang et al., 2013). They then reported their study findings of adult populations who exceeds this dietary sodium chloride (salt) recommendation from 2003 to 2010. During 2003 to 2010, a slight decrease occurred in population sodium chloride (salt) intake.

Table 1.1.1 : Proportion Of Sodium Chloride (Salt) Intake Exceeding The Institute Of Medicine Tolerable Upper Intake By Age Group, Gender, and Race/Ethnicity As Reported By Carriquiry et al., (2013) From 2003 To 2006

Characteristic	Upper Limit (mg/day)	2003-20		
		No.	Proportion Over upper Intake level (%)	Standard error
Age 19-50 years	1 teaspoon of sodium chloride (salt) (5.8g) or equals to 2300mg of sodium.	5428	(95.9)	0.4
Male		2528	(99.2)	0.1
Female		2900	(86.6)	1.2
White, non- Hispanic		2384	(97.1)	0.4
Black, non- Hispanic		1310	(92.5)	1.4
Mexican-American		1276	(93.5)	1.0
Age >/= 51 years	1 teaspoon of sodium chloride (salt) (5.8g) or equals to 2300mg of sodium.	4062	(88.9)	1.0
Male		2028	(95.9)	0.6
Female		2034	(77.1)	1.4
White, non- Hispanic		2416	(91.4)	0.9
Black, non- Hispanic		762	(79.0)	2.4
Mexican-American		674	(67.7)	3.9

This report by Carriquiry et al., (2013) has shown that in 2010, more than 90% of the adults in America exceeded the sodium chloride (salt) intake recommendation. However, it is also understood that the trend has no much changes since 2003. Reduction the amount sodium chloride (salt) consumed is closely related to amount of energy consumed, so that actually reducing sodium chloride (salt) in food is a coupling effort with that to reduce obesity. Obesity is largely the effect to an excess calorie or energy consumption in daily food, especially when the food tastes delicious with excessive use of salt in the preparation. This is an important implication of public health practice.

Table 1.1.2 : Proportion Of Sodium Chloride (Salt) Intake Exceeding The Institute Of Medicine Tolerable Upper Intake By Age Group, Gender, And Race/Ethnicity As Reported By Carriquiry et al., (2013) From 2007 To 2010

Characteristic	Upper Limit (mg/day)	2007-2010		
		No.	Proportion Over upper Intake level (%)	Standard error
Age 19-50 years	1 teaspoon of sodium chloride (salt) (5.8g) or equals to 2300mg of sodium.	6086	(95.4)	0.5
Male		2936	(99.1)	0.2
Female		3150	(84.8)	1.4
White, non- Hispanic		2598	(96.4)	0.6
Black, non- Hispanic		1190	(93.4)	0.8
Mexican-American		1270	(90.8)	1.3
Age >/= 51 years	1 teaspoon of sodium chloride (salt) (5.8g) or equals to 2300mg of sodium.	4668	(90.1)	0.8
Male		2341	(96.5)	0.5
Female		2327	(77.9)	1.4
White, non- Hispanic		2273	(92.8)	0.8
Black, non- Hispanic		975	(82.2)	2.0
Mexican-American		757	(76.3)	3.1

The study findings as recorded in these tables clearly showed the sodium chloride (salt) intake is above level of recommendations among males, females, white, black and Mexican. In the Middle East, a similar study on sodium chloride (salt) intake, dietary knowledge, and illness perceptions of controlled and uncontrolled rural hypertensive patients has been done in Iran in 2013. It is concluded that knowing the patient's nutritional knowledge and illness perceptions can be used to predict the amount sodium chloride (salt) intake, especially among the uncontrolled hypertensive patients (Aziz, Leila, Gholamreza, Behzad and Afshan, 2014). This study is significant as community is comprised of healthy and sickly individuals, who consumed similar food and seasonings or sauces.

Zhang, Guo, Seo, Xu, Xun, Ma et al., (2015) study in Shandong province of China reported that most participants indicated they favored low sodium chloride (salt) diet, with more females favoring low sodium chloride (salt) diet, but 31% of subjects reported less sodium chloride (salt) consumption resulted in less physical strength. Approximately one third of participants reported that they consumed excess amount of sodium chloride (salt), over four fifth of subjects indicated that they have intention to reduce sodium chloride (salt) intake, and among subjects who reported no intention to reduce sodium chloride (salt) 80% were afraid that less sodium chloride (salt) will affect food taste. South East Asia region has a very rich and diverse culture with extensive use of sodium chloride (salt) and spices in food (Mohan and Prabhakaran, 2013). In Asia region, a similar study but majoring on hypertension in India by Parmar, Rathod, Rathod, Goyal, Aggarwal and Parikh, (2014) on the assessment of knowledge, attitudes and practices towards hypertension found that most of participants know diet rich in sodium chloride (salt) causes hypertension (82.4 %).

In Malaysia, there is not much data collected in this section of sodium chloride (salt) intake. One of the studies in Malaysia by WASH, (2015) study shows many of the sauces commonly used in Malaysian cooking contain over 2.5g per sodium chloride (salt) / tablespoon and in addition to this, a large number of Malaysians frequently patronise hawker centre. This will have a substantial effect on sodium chloride (salt) intake as foods eaten in hawker centre are often high in sodium chloride (salt), and a single serving of some of the dishes contribute more than, or close to 1 day's recommended daily sodium chloride (salt) intake of 6 grams/day. Also in Malaysia there is currently no legal obligation to label the sodium chloride (salt) content of processed foods sold in market.

Therefore it is virtually impossible for the consumer to know how much sodium chloride (salt) is in a product, and consequently they are not aware of how much sodium chloride (salt) they are eating (WASH, 2015) . This definitely affects the way of people buying and preparing their food in Malaysia as sodium chloride (salt) content in a lot of processed foods are not written on the packages. In order to do a research on the topic related to sodium chloride (salt) intake in Malaysia, I searched on patients of Outpatients Clinic Hospital USM. Most of the patients attending Outpatient Clinic Hospital USM are adult patients where the statistics collected by Record Unit Hospital USM shows the majority of the patients are adult patients of more than 12 years old.

Table 1.1.3 : Statistics On Age and Month During Patient Registration of Outpatients Clinic Hospital USM in 2007 by Record Unit Hospital USM

Month	Jan	Feb	Mar	Apr	Mei	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2007
Adult (>12 years old)	5322	4990	5426	5387	5723	5657	6576	5880	5125	5574	5663	5857	67180
Children (1-12 years old)	448	442	536	490	571	504	719	663	530	471	542	517	6433
Infant (<1 year old)	0	0	0	0	0	0	0	0	0	0	0	0	0
No birthdate	0	5	3	2	1	3	1	2	1	3	1	2	29
Jumlah	5775	5437	5965	5879	6295	6164	7296	6545	5656	6048	6206	6376	73642

To relate to this information, the study done in United Kingdom, United States, China and Japan shows that adults who are at low risk in developing cardiovascular diseases consume lower sodium chloride (salt) intake compared to adults who are at higher risk (Shay, Stamler, Dyer, Brown, Chan, Elliot et al., 2012). I believe that the same trend also goes on in Malaysia. Supporting this point, a study in Ontario, Canada showed the adults aged 20 and above who are diagnosed with hypertension has

increased significantly from 12.5% at 1998/99 to 19.6% at 2007/08 (Robitaille, Dai, Waters, Loukine, Bancej, Quach et al., 2012).

1.2 Problem Statements

Studies around the world shows that people diets are high in sodium chloride (salt). Zhang et al., (2015) acknowledged that Chinese diet is high in sodium chloride (salt). Chinese Nutritional Study Survey (1982,1992 and 2002), also Chinese Behavioral Risk Factor Surveillance indicated that about 80% of the Chinese exceeded the Chinese Nutritional Society's (2007) recommended sodium chloride (salt) intake upper level of 6 g per day.

It is also clear from looking at dietary trends that Malaysian's sodium chloride (salt) intake is currently at least 10 000 to 15 000mg / day which is far exceeding the WHO recommended daily sodium chloride (salt) intake of 6 gram per day (WASH, 2015). In addition to that, study done by Choong, Balan, Chua and Say, (2012) showed about 90% of sodium chloride (salt) is largely added in food processing, in restaurant food, in sauces and cooking. As for example, the sodium content of a takeaway cheeseburger and French fries is estimated at 1240 mg, while the sodium content of foods like chick peas, sweetcorn and peas, which are naturally very low in sodium, increases by 10-100-fold after processing. Other than processed food, some foods commonly consumed in Malaysia are also high in sodium chloride (salt), for example a bowl of curry noodle and a bowl of soup noodle available at hawker stalls contain about 2500 mg and 1700 mg sodium chloride (salt).

Meanwhile Land, Webster, Christofou, Johnson, Travena, Hodgins et al., (2014) had stated that decreasing dietary sodium chloride (salt) from the estimated global level of 9-12 grams per day to the recommended level of less than 6 grams per day would

have a significant impact on blood pressure levels and cardiovascular diseases. This statement support that consumed sodium chloride (salt) is always associated with health issues such as high blood pressure, heart diseases, stroke, kidney stones, asthma, osteoporosis, stomach cancer and many more diseases. Excess sodium chloride (salt) intake is also associated with increased blood pressure, and high blood pressure is a major cause of cardiovascular disease worldwide (Aziz et al., 2014). The most associated disease to high sodium chloride (salt) intake, hypertension affects close to one billion individuals worldwide (Azuana, Nur Sufiza and Paraidathatu, 2012). Globally, the overall prevalence of raised blood pressure in adults aged 25 and over was around 40% in 2008 (Ray and Jamdade, 2015).

Similar to Aziz et., (2014) study, study by Bollu, Nalluri, Prakash, Lohith and Venkatamarao.,(2015) also found that hypertension is a silent killer disease worldwide and is major risk for many other diseases like cardiovascular diseases, stroke, renal diseases and many other diseases. Premanandh, Ferriera, Vaz, Kulkarni, Perni, Kamat and Pinto, (2014) cited that WHO states worldwide raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of all deaths. This account for 57 million disability adjusted life years or 3.7% of total DALY.

Prevalence of hypertension in Malaysia has significantly increase over the years. Ministry of Health Malaysia, (2011) reported that 32.7% (5.8 million) of adults 18 years and above in Malaysia have hypertension, and adults of 30 years and above, 43.5% of them have hypertension, with 12.8% are known to have hypertension and 19.8% are previously undiagnosed with hypertension. This has significantly increased compared to Malaysian hypertension prevalence in 2004. In Malaysia, the prevalence of hypertension among adults aged 30 years and above has increased from 32.9% in 1996 to 40.5% in 2004 (Azuana et al., 2012).

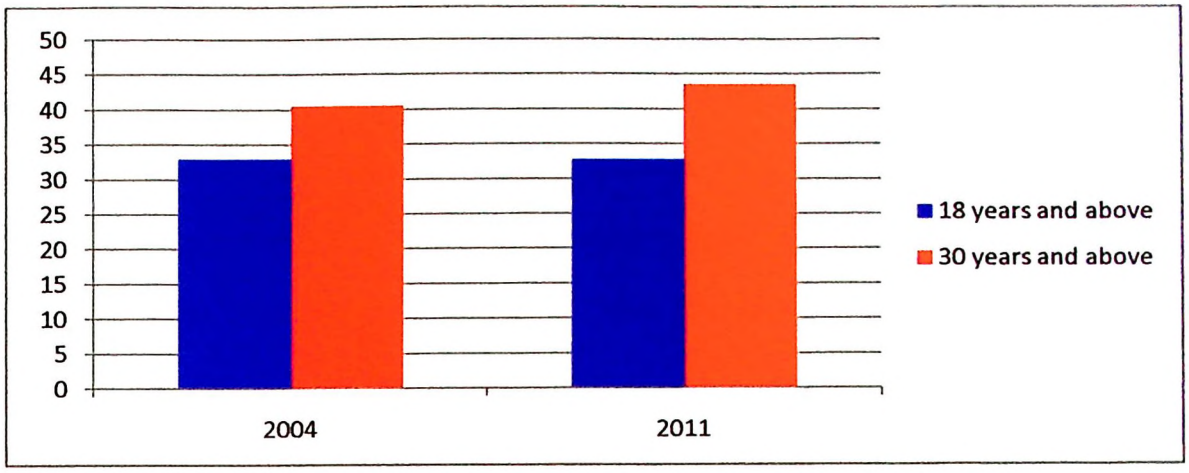

Figure 1.2.1 : Bar Chart Of Percentage Of Malaysians Having Hypertension In 2004 And 2011 Based On Ministry of Health Malaysia 2011

Race also contributes to hypertension problem. This is probably due to the sodium chloride (salt) amount in daily food usually taken in the race and the culture. Malays and the indigenous people from the state of Sabah had the highest hypertension prevalence estimates (41.3%) followed by the indigenous people of Sarawak (40.4%), the Chinese (40.0%), and the Indians (37.7%) (Azuana et al., 2012).The percentage of Malaysians having hypertension according to the race is shown in the pie chart below.

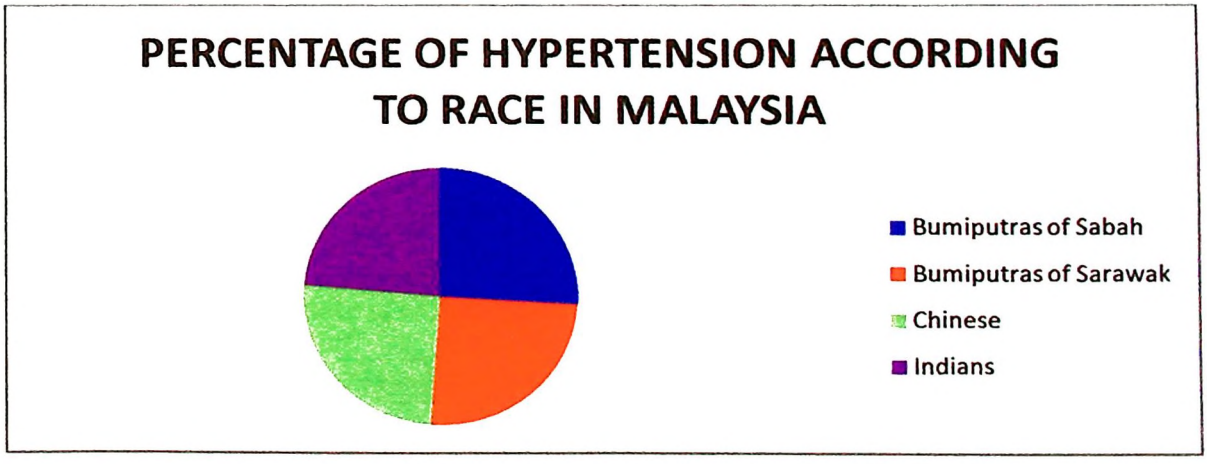

Figure 1.2.2 : Pie Chart Of Percentage of Malaysians Having Hypertension According To Race In Malaysia Based On Ministry of Health Malaysia 2011

People knowledge of diseases that resulted from excessive sodium chloride (salt) intake is yet to be assessed, especially in Malaysia where such study is non available despite high occurrences of these diseases. With this light, I decided to do a research on knowledge and behaviour towards sodium chloride (salt) intake among patients getting treatment in Outpatients Clinic Hospital USM. Theory of Planned Behavior by Ajzen, modified by Reeve and Assen will be used in this study as a framework to identify knowledge and behaviour towards sodium chloride (salt) intake.

This theory is composed by three elements (Perceived Behavioral Control, Positive Attitude and Subjective Norm), which each can be represented by independent variables on this research. Knowledge is the representative of Perceived Behavioral Control, and Subjective Norm is represented by behaviour of persons regarding sodium chloride (salt) intake. Combining these understandings, it can be explained as people are likely to take action if they believe what they are going to do bear a significant value (such as successful experiences of avoiding or controlling diseases and positive feedbacks). One implication is that educators should work to instill positive attitude into people in order to change their choice of action (Xu, Sun, Lin, Chen, Yang, Chen and Cao, 2010).

1.3 Research Objectives

1.3.1 General Objective

The aim of this study is to determine the knowledge and behaviour towards sodium chloride (salt) intake among adult patients getting treatment in Outpatients Clinic Hospital USM.

1.3.2 Specific Objectives

1) To determine the score of knowledge and behaviour towards sodium chloride (salt) intake among adult patients getting treatment in Outpatients Clinic Hospital USM.

2) To determine the association between the knowledge and behaviour towards sodium chloride (salt) intake with selected socio-demographic data such as (age, gender and educational level) among adult patients getting treatment in Outpatients Clinic Hospital USM.

3) To determine the association between knowledge and behaviour towards sodium chloride (salt) intake and sodium chloride (salt) related medical illnesses.

1.4 Research Questions

1) What is the of the score of knowledge and behaviour towards sodium chloride (salt) intake among adult patient getting treatment in Outpatient Clinic Hospital USM?

2) Is there any association between the knowledge and behaviour towards sodium chloride (salt) intake with selected socio-demographic data such as (age, gender and educational level) among adult patient getting treatment Outpatient Clinic Hospital USM.

3) What is the association between knowledge and behaviour towards sodium chloride (salt) intake and sodium chloride (salt) related medical illnesses?

1.5 Research Hypothesis

Hypothesis 1: H_0: There is no significant association between knowledge and behaviour towards sodium chloride (salt) intake.

H_1 : There is a significant association between knowledge and behaviour towards sodium chloride (salt) intake.

Hypothesis 2 : H_0: There is no significant association between knowledge and behaviour towards sodium chloride (salt) intake with selected socio-demographic data such as (age, gender and educational level).

H_1: There is a significant association between knowledge and behaviour test scores towards sodium chloride (salt) intake with selected socio-demographic data such as (age, gender and education level).

Hypothesis 3: H_0: There is no significant association between knowledge and behaviour towards sodium chloride (salt) intake and sodium chloride (salt) related medical illnesses.

H_1: There is a significant association between knowledge and behaviour towards sodium chloride (salt) intake and sodium chloride (salt) related medical illnesses.

1.6 Definition of Terms

Knowledge -Suriasumantri,(1990) define knowledge as the result of the act of thinking, is a light that shows basic of civilization, where human found themselves and human developed many ways to improve

the quality of life by implementing of what they know.

In this study, the experts of nutritions of Pan American Health Organization (PAHO, 2009) has developed an instrument (the way) to measure the knowledge, by assessing:

(1) sort of health problem people know been caused by high sodium chloride (salt) diet.

(2) if people know consuming high sodium chloride (salt) diet can cause serious health problems

(3) if people know there is recommended amount of dietary sodium chloride (salt) per person per day

(4) if people know the difference of sodium chloride (salt) and sodium

(5) if people know general sodium chloride (salt) amount in food

Behaviour

-Watson, (1913) sees the behaviour as the separate observation of 'states of consciousness' and the consciousness may be said to be the instrument or the tools with scientists work with. With regard to this study, the consciousness as a subject is measured by a tool, the PAHO., (2009) nutritionists developed questionnaires, by assessing:

(1) consciousness about eating a balanced diet

(2) consciousness about minimizing the amount of dietary sodium chloride (salt)

(3) consciousness about paying attention to indications on packages such as 'no added sodium chloride (salt)', 'low in sodium chloride (salt)'

(4)consciousness about frequency of adding table food sodium chloride (salt)

(5) consciousness about frequency of adding sodium chloride (salt) in cooking

(6) consciousness about any effort to reduce sodium chloride (salt) in food

Salt Intake

-Based on Kare, Fregly and Bernard., (1980) sodium chloride (salt) intake study refers to the overview of the pathological and physiological importance attached to the levels of salt intake in health and in disease. In this study of mine, I based as Kare et al., (1980) has searched, examining the scientific information on innate human appetite for salt, and the variations of the appetite as the expression of biological needs, behavioural patterns and the normal or disturbed physiology as a result of that. The second chapter then explores the relations between knowledge, causations, taste, intake, preference, and hypertension with other diseases that maybe coming along with excessive salt intake.

The actual measurement of sodium chloride (salt) intake of 1 gram is equals to 393.3mg of sodium alone (WHO, 2006). Schmerling, (2014) recommended that the safe intake of sodium chloride (salt) / day is 5.8g of sodium chloride (salt). The understanding can be enhanced by understanding computation below:

Sodium Chloride (salt) = NaCl (salt)

Sodium is a component in Sodium Chloride (salt)

1g of NaCl is equal to / = 393.3 mg of sodium / Na

If the recommended amount of salt per day is 5.8g of NaCl,

1g of NaCl = 393.3mg of Na

5.8g of NaCl = ϙ mg of Na

Cross multiplication gives:

(1g of NaCl ×ϙ mg of Na) = (393.3mg of Na × 5.8g of NaCl)

$$\text{ϙ mg of Na} = \frac{(393.3\text{mg of Na} \times 5.8\text{g of NaCl})}{1\text{g of NaCl}}$$

ϙ mg of Na = 2281.14mg of Na

As the conclusion,

In terms of sodium chloride (salt), the recommended amount to be taken per day is 5.8g of NaCl and in terms of only sodium, the recommended amount to be taken per day is 2281.14mg of Na (sodium).

5.8g of NaCl based on Harvard Medical School,(2015) is also equals to 1 tablespoon of sodium chloride (salt). In laymen term understanding, the recommended amount of salt to be taken per day is a tablespoon of salt.

Adult Patients -In this study, adult patients refers to following characteristics such as having or not having appointments at the Outpatients Clinic Hospital USM, aged 18 and above, alert to time, place and person. In addition to that, should be literally intelligent and able to make decision on her or his own without the influence of the family members, fellow patients or researcher.

Getting Treatment -Getting treatment refers to the way or action taken to act upon the specified condition, dealing or discussing with professionals about the subject. In this study, the actor taking action on the

condition (diseases) are adult patients going to the clinic to seek solver for their trouble by meeting the healthcare professionals in Outpatients Clinic Hospital USM.

Outpatient Clinic Hospital USM	-In this study, this subject refers to the Klinik Rawatan Keluarga Hospital USM where adult patients are getting treatment, at the waiting lounge on bench while waiting for the turn to be consulted, where researcher would go approach them and explain about the research conducted.

1.7 Significance of The Study

This study generated information and develops a view on the knowledge and behaviour on sodium chloride (salt) intake among the adults in Malaysia. It is important to provide the idea and explore the relationship between these two variables of sodium chloride (salt) intake of people to recognize their superior ability in self-management of sodium chloride (salt) intake. In other words, this study outcome is crucial to determine the knowledge and behaviour of people towards their health control and reduces complications from sodium chloride (salt) intake.

Health care providers is hoped to give future education based on this study result in order to achieve expected outcome which include disease control and reduce chronic complications. Besides that, the findings of this study provide implications for the healthcare providers, health professionals, hospitals and healthcare policies in Malaysia. Salwa and Ayman, (2013) presses on giving education about effective lifestyle such as sodium chloride (salt) restriction, healthy food, reducing weight to gain ideal Body

Mass Index, and increase physical activity to achieve the great benefits of controlling blood pressure and avoiding future complications.

The hospital and healthcare policies is also important in planning and implementing the healthcare activities or programs to the society. This is necessary especially when the patient have existing diseases, such as having hypertension, cardiovascular diseases, stroke and others. Salwa, Ayman, Syed Azhar and Mohamed Azmi, (2011) discussed that presence of hypertension in diabetic patients dramatically increases rate of complications, and when happening together the two disease entities seems to aggravate each other worsening health condition and affecting cardiovascular system.

A study on prevalence of hypertension in Myanmar by Zaw, Latt, Aung, Thwin and Myint, (2011) discusses about the pieces of information from studies related can be used for advocacy for strengthening hypertension preventions and control activities. Here, this research data is imperative in order of other researchers to develop innovative management and effective intervention of health care promotion or education in the health care system among adults in order to improve their quality of life in terms of managing their dietary sodium chloride (salt).

As there is scarce study about sodium chloride (salt) intake in Malaysia, this study is among the pioneer undergraduate study in this area. I hope that this study will work well in future and can be published and become a reference for next researchers and readers interested in this topic. This study result will definitely add up to the existing information available especially in Malaysia. The work and result in this study is specially dedicated to future readers and information seeker.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction to the Chapter

This chapter reviews the academic reports on sodium chloride (salt) intake. The journal articles discuss on the knowledge and behaviour of people towards sodium chloride (salt) intake. The knowledge will include the causations of sodium chloride (salt) intake and recommendation of sodium chloride (salt) intake to normal person. Meanwhile the behaviour part will have an eye on the reduction of dietary sodium chloride (salt). Newson, Elmadfa, Biro, Cheng, Prakash and Rust et al.,(2013) cited Kim, Lopetcharat and Drake., (2012) highlighted that knowledge of salt intake, and health beliefs are important in order to change the dietary sodium chloride (salt) habits, particularly because of sodium chloride (salt) intake is hard to estimate and monitor.

2.2 Knowledge Towards Sodium Chloride (Salt) Intake

From the study models in high-, middle- and low income countries done by Chow et al., (2013) of adjusted age, sex and urban/rural setting, it can be said that participants with more education had greater awareness and control of hypertension, specifically in reducing their sodium chloride (salt) intake. Education on sodium chloride (salt) intake is very much needed, using available elements.

Family is a prominent element of the social environment where dietary behaviors are enacted and learned, and mothers play roles in nutrition (Rabea, Iraj, Mahnaz and Farzane, 2015). It can be said that women plays great role in families to educate family members on healthy eating and sodium chloride (salt) restrictions. In addition to that, women are usually having higher level of knowledge on sodium chloride (salt) intake compared to men in any age group.

In another perspective, Sibel, Fatma, Hutya and Mehmet, (2015) conducted a knowledge towards sodium chloride (salt) intake study among hemodialysis patients in Turkey which shows that most of them (92.8%) know that sodium chloride (salt) is harmful for health and there are no statistically difference between genders, education and economic status of them about this knowledge. The knowledge score also does not show significant differences between older and younger ages.

2.2.1 Causations of Sodium Chloride (Salt) Intake

High sodium chloride (salt) intake effect to the health usually starts with elevated blood pressure. Historically in 1957, a normal blood pressure was defined as readings of < 140mmHg systolic and <90mmHg diastolic by 2 examiners, and definite hypertension as readings of a systolic of 160 mmHg or diastolic of more or equal 95mmHg, with readings in between defined as possible high blood pressure (Franklin and Wong., 2013). High blood pressure elevation then continues with the advancement of other diseases such as cardiovascular disease, chronic kidney disease, end stage renal failure and others.

Dietary sodium chloride (salt) has been shown to be positively associated with raised blood pressure. It is important to see how people perceive their sodium chloride (salt) intake to see how they manage their own health conditions. Blood pressure can be managed by non pharmalogical approach such as sodium chloride (salt) restriction (Ray and Jamdade., 2015). Sodium chloride (salt) restriction effectively controls the blood pressure among hypertensive and non hypertensive adults. In addition to coronary heart diseases and stroke, complications of raised blood pressure includes heart failure, peripheral vascular disease, renal impairment, retinal hemorrhage and visual impairment (Ray and Jamdade., 2015).

In cross sectional study of 153 996 adults of Canada, Sweden, United Arab Emirates, Argentina, Brazil, Chile, Malaysia, Poland, South Africa, Turkey, China, Colombia, Bangladesh, India, Pakistan and Zimbabwe, 57 840 had hypertension and among them, 26 877 were aware of their condition, 23 510 were receiving treatment and 7634 had their hypertension controlled (Chow, Teo, Rangarajan, Shofiqul, Avezum and Ahmad et al., 2013). The percentage of hypertensive patients get their blood pressure controlled in this study is significantly low and weak at 13%. Although this result does not include non hypertensive adult, it shows that blood pressure control is generally poor among population. This also suggests high sodium chloride (salt) intake among population in the world, including Malaysia.

2.2.2 Recommendation of Sodium Chloride (Salt) Intake

WHO recommends the maximum level of sodium chloride (salt) intake per person to be less than 5g/day (Claro et al., 2012). In the other hand, Lara et al., (2014) had stated that the upper limit for sodium intake has been set at 2300 mg/day (close to 6g of sodium chloride (salt) per day) by the IOM. The safe amount of sodium chloride (salt) to be taken is a questionable issue because people has varying knowledge and behavior towards safe sodium chloride (salt) intake.

Additionally, Mohan and Prabhakaran., (2013) had stated few scientific reviews on sodium chloride (salt) and health, including SACN 2003, who recommended to reduce the mean population sodium chloride (salt) intake to 6 g/day. They also cited DNPCD: Report of a Joint WHO/FAO Expert Consultation 2003 as recommending sodium chloride (salt) consumption of less than 5 g/day while ensuring that the sodium chloride (salt) is iodinated, and AHA Presidential Advisory (2011, 2012), who recommended salt consumption of 3.75 g/day or less.

2.2.3 Good And Poor Knowledge Towards Sodium Chloride (Salt) Intake

Sarmugam and Worsley, (2014) cited Neale et al., (1993) as concluding a poor knowledge among population in their study. In that study, knowledge on sodium chloride (salt) content of ten selected foods (cornflakes, tomato ketchup, soft margarine, cheddar cheese, white bread, baked beans, milk chocolate, cod, tomato and apple) was assessed. The maximum possible score for each right answer was 20, but the average score was 10.34, which was only 3.1 higher than the value expected by chance (7.2). The level of knowledge among population on sodium chloride (salt) content in food is generally poor according to this particular study.

In the other hand, a study has also been done in Lebanon, a Middle East country where rates of cardiovascular diseases are amongst the highest in the world. Less than one fourth of the study subjects were able to identify processed food as the main source of sodium chloride (salt) in Lebanese diet. Similarly, only half of the participants were able to correctly describe the relationship between salt and sodium, and less than one third of the subjects were aware that 6 g of sodium chloride (salt) daily is the maximum limit intake (Lara et al., 2014).

The level of knowledge on dietary sodium chloride (salt) in terms of choosing food is moderate. Sarmugam and Worsley, (2014) also reported assessment on procedural knowledge of choosing food among individuals. They reported Grimes et al., (2009) and Sarmugam et al., (2014) study found that majority of individuals are able to use nutrition information panel to select food product with lower sodium chloride (salt) content however Grimes et al., (2009) also found that less than 50% of participants are able to use the percentage daily intake (%DI) system to rank food with highest to lowest sodium chloride (salt) content.

Health Canada, (2009) report cited by Sarmugam and Worsley, (2014) stated that respondents with high level of knowledge towards dietary sodium chloride (salt) reported that they take actions to control their sodium chloride (salt) intake. Among actions taken to reduce sodium chloride (salt) intake are, do not add sodium chloride (salt) when cooking (42%), do not add sodium chloride (salt) on table (39%), avoid/minimize consumption of processed foods (24%), look at Nutrition Facts Tables on food (21%), monitor use of salty food (19%), buy low sodium chloride (salt) and low sodium foods (15%), avoid eating out (7%) buy / cook with fresh foods (7%), buy low sodium chloride (salt) / sodium alternatives (6%) and use spices other than sodium chloride (salt) when cooking (6%).

2.3 Behaviour Towards Sodium Chloride (Salt) Intake

Study on Greek adults by Marakis, Tsigarida, Mila and Panagitakos, (2013) assessing their knowledge, attitudes and behaviour towards sodium chloride (salt) consumption found that women of all age group compared with men reported adding sodium chloride (salt) during cooking while less women reported adding sodium chloride (salt) on the table. More women believed that sodium chloride (salt) added during cooking is the main source of sodium chloride (salt) in diet, while in terms of age, younger people apparently have more knowledge of consuming less sodium chloride (salt), and do consume less sodium chloride (salt) compared to older people. Study in Lebanon showed the mean behaviour score is also significantly higher in women compared to men, and gender disparities also exist in practice part, especially in checking food label, sodium chloride (salt) label content and influence of sodium chloride (salt) content to their spending.

Women seemed to be caring for their health stricter compared to men. Increasing age also increase the knowledge and behaviour score, whereas having specialized health related major was significantly associated with a higher knowledge (Lara et al., 2014). Behaviour towards dietary sodium chloride (salt) can be trained by health coaching for example diet modification according to the DASH (Dietary Approaches to Stop Hypertension) diet and reduction of sodium chloride (salt) intake (Su, Hazreen, Azmi, Nurul Ain, Farizah, Thangiah, Maznah, Awang and Murray, 2014). This training can change how people see sodium chloride (salt) in their food and adopt beneficial behaviours.

In the DASH study, less than half of the participants reported that they had already taken action towards sodium chloride (salt) reduction, and females were likely to perceive themselves at risk of high sodium chloride (salt) intake and reported intention to reduce sodium chloride (salt) intake and took actions regarding sodium chloride (salt) reduction (Zhang et al.,2013). Meanwhile a study by Rho and Kim, (2013) in Jeonbuk area, Korea showed that there was a significant positive correlation between knowledge about sodium chloride (salt) and dietary behavior related to sodium chloride (salt). Claro et al., (2012) mentioned in their study that 80% of participants are trying to eat a healthy diet. The proportion of participants aiming to reduce sodium chloride (salt) intake is significantly associated with the capacity to recognize high dietary sodium chloride (salt) as a threat to their health. Study on women of Chabahar, Iran showed significant direct association between attitude, subjective norms, perceived behavioral control, intention and sodium chloride (salt) consuming behavior (Rabea et al., 2015).

There was a significant association between attitude (sig. < 0.001), subjective norms (sig. < 0.01) and perceived behavioral control (sig. < 0.01), and intention to reduce sodium chloride (salt) consumption, however the association between perceived behavioral control and sodium chloride (salt) consuming behavior was not significant.

2.3.1 Reduction of Sodium Chloride (Salt) Intake

Agreeing to those recommendations of sodium chloride (salt) reduction, Land et al., (2014) had stated that decreasing dietary intake from the estimated global level of 9-12 grams per day to the recommended level of less than 6 grams per day would have a significant impact on blood pressure levels and cardiovascular diseases. This statement support that consumed sodium chloride (salt) is always associated with health issues such as high blood pressure, heart attack, stroke, kidney stones, asthma, osteoporosis and many more diseases. In most of developed countries, a reduction in sodium chloride (salt) intake can be achieved by a gradual and sustained reduction in the amount of sodium chloride (salt) added to food by the food industry, however, in other country such as Iran where most of sodium chloride (salt) consumed come from sodium chloride (salt) added during cooking or from sauces, it is important to reduce sodium chloride (salt) during cooking (Rabea et al., 2015).

However, Newson et al., (2013) says that although sodium chloride (salt) reduction was seen to be healthy, over one third of the participants does not have interest to reduce sodium chloride (salt) consumption. Newson et al., (2013) cited Kaczorowski et al., (2010) as saying local interventions of sodium chloride (salt) intake is successful however implementing the global sodium chloride (salt) reduction programmes will be more effective (Webster, Dunford, Hawkers and Neal., 2010).