A STUDY OF URINARY TRACT INFECTION AMONG HOUSEWIVES IN A COMMUNITY SETTING

by

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ABBREVIATIONS

CRP	-	C-reactive Protein
ESRF	-	End Stage Renal Failure
HBM	-	Health Belief Model
ESR	-	Erythrocyte Sedimentation Rate
LUTS	-	Lower Urinary Tract Symptoms
SPSS	-	Statistical Package Social Sciences
STI	-	Sexually Transmitted Disease
UTI	-	Urinary Tract Infection

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ABSTRACT

Urinary tract infection (UTI) is one of the most infection that commonly affected female population. Substantial evidence can be found in the literature to show the prevalence and awareness as well as a facts on UTI including risk factors, etiology, sign and symptoms, complications and treatment. The general objective of the study was to assess the awareness of UTI among housewives in Kampung Kedai Mulong, Kota Bharu, Kelantan. This cross sectional study was done on 95 housewives by convenience sampling technique and validated questionnaires were given to the housewives that fits the inclusion criteria. Data was statistically analyzed using software package SPSS version 20. The data was analyzed using descriptive statistic, Pearson Chi Square, Fisher Exact test, and Stata test. The result showed that the prevalence of UTI among housewives was low which was 23.2%. As for awareness, mostly of the housewives (n= 69, 72.6%) were highly aware regarding UTI. However, there was no association found between awareness level and the prevalence of UTI (p>0.05). Besides that, there was also no association found between selected socio-demographic data (age, education level, family income), and personal hygiene with the prevalence of UTI (p>0.05). Therefore, further study need to be done to emphasized on the prevalence, preventive measures, support from health professionals, screening programmes and to provide important information as well as to improved public understanding about UTI.

KAJIAN TENTANG JANGKITAN SALURAN KENCING DALAM KALANGAN SURI RUMAH DI KAWASAN KOMUNITI

ABSTRAK

Jangkitan saluran kencing merupakan salah satu jangkitan yang sering menyerang kaum wanita. Pelbagai bukti dapat ditemui berdasarkan kajian lepas mengenai prevalens dan kesedaran dan juga faktor risiko, penyebab, gejala jangkitan, komplikasi dan juga rawatan. Objektif umum bagi kajian ini adalah untuk menilai tahap kesedaran terhadap jangkitan saluran kencing dalam kalangan suri rumah di Kampung Kedai Mulong, Kota Bharu, Kelantan. Kajian keratan lintang ini telah dijalankan ke atas 95 suri rumah melalui kaedah persampelan secara kebetulan dan set soalan soal selidik yang telah disemak juga diberi kepada responden yang memenuhi kriteria. Data telah dianalisis menggunakan pakej perisian SPSS versi 20. Data dianalisis dengan menggunakan statistik deskriptif, Pearson Chi Square, ujian Fisher Exact, dan ujian Stata. Keputusan yang telah dianalisis menunjukkan tahap prevalens jangkitan saluran kencing dalam kalangan suri rumah adalah rendah iaitu sebanyak 23.2%. Manakala bagi tahap kesedaran suri rumah mengenai jangkitan saluran kencing adalah tinggi iaitu sebanyak (n=69, 72.6%). Namun begitu, tiada perkaitan antara tahap kesedaran dan prevalens jangkitan saluran kencing (p>0.05). Selain itu, tiada perkaitan antara data sosio-demografik (umur, tahap pendidikan, pendapatan keluarga) dan tabiat peribadi dan prevalens jangkitan saluran kencing (p>0.05). Oleh yang demikian, kajian lanjut diperlukan untuk mengenalpasti prevalens, langkah pencegahan, sokongan dari professional kesihatan, program saringan dan untuk memberi maklumat penting serta untuk memantapkan kefahaman orang awam mengenai jangkitan saluran kencing.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Urinary tract infection (UTI) is defined as the presence of bacteria in the urine (bacteriuria). The principal bacterial infections of the kidney and urinary tract occur in either the renal parenchyma (pyelonephritis) or bladder (cystitis) (Lee, 2007). Generally, according to Earhart (2010), women are prone to get UTI for anatomical reasons. One of the factors is that woman's urethra is shorter, which is average of 4 cm in length that will increase chances for bacteria to have quick access to the bladder (Earhart, 2010). Furthermore, woman's urethral opening is also near to the sources of bacteria, which is from the anus and vagina (National Kidney and Urologic Diseases Information Clearinghouse, 2012).

1.1.1 The types of UTI

Generally, UTI are classified into two types; upper and lower UTI. However, for this current study, the researcher was generally focus for this two type of UTI, that included women as a main aspect of study as a respondent due to the prevalence of women is higher as compared to men.

1.1.1.1 Upper UTI

Upper UTI is infections that affect the upper urinary tract. It is also known as pyelonephritis, which refers to the inflammation of the renal pelvis, interstitial nephritis and renal abscesses. Generally, upper UTI is causes by either the invasion of bacteria from the bladder or systemic sources such as via bloodstream, that spreading to the kidney. This type of UTI was more give harm and severe than lower UTI (Smeltzer *et al.*, 2010).

1.1.1.2 Lower UTI

Lower UTI is an infections involving lower urinary tract such as cystitis that refer to the inflammation of urinary bladder, prostatitis that is inflammation of prostate gland and urethritis that is inflammation of the urethra (Heffner & Gorelick, 2008). UTI is a type of infection that can be cause by many factors.

1.1.2 The causes of UTI

There are several causes of UTI. As mentioned earlier, the meatus, or also commonly known as urinary opening, is situated in front of the vagina and closer to the rectum than in males. So, UTI is an infection caused by the presence and growth of microorganisms anywhere in the urinary tract. It is perhaps the single most common bacterial infection of mankind. Most commonly, UTI occurs when gastrointestinal bacteria (bacteria in the gut) enter through the urethra and start multiplying in the bladder. Our defense system is designed to keep such germs out, but sometimes they fail and bacteria may take hold and multiply into an infection (Earhart, 2010).

1.1.3 The symptoms of UTI

The symptoms of a UTI are varies by age, gender, and whether a urinary catheter is present. By referrring to Johansen *et al.*, (2011), sometimes microorganisms enter the urinary tract without causing problems which is called as asymptomatic bacteriuria. Among young women, UTI symptoms typically include a frequent and intense urge to urinate and painful, burning feeling in the bladder or urethra during urination. The amount of urine may be very small. Moreover, the presence of pathogens in the urine is considered to be a risk factor for a clinical infection. Local and systemic symptoms may arise when pathogens invade the urothelium. In other word, the higher up in the urinary tract the invasion takes place, the more serious is the clinical situation (Johansen *et al.*, 2011).

1.1.4 Prevalence of UTI

According to Franco (2005), UTI is one of the most common bacterial infections that affecting 20% of women between age 20 and 56 years old per annum. Besides that, it has been reported that 50% of women suffer at least one episode of UTI in their lifetime. One in four of these women will develop a recurrence UTI, and 27% will experience a recurrence within 6-12 months. Recurrence rates are higher and recurrence intervals are shorter (< 60 days) in those who are catheterized (Franco, 2005). Meanwhile, Kolawole and friends (2009) argued that managing UTI is challenging, not only because of the large number of infections that occur each year, but also because of the diagnosis of UTI is not straight forward. Criteria for the diagnosis of UTI is vary and greatly depending on the patients and context (Kolawole *et al.*, 2009).

Besides that, in a study of acute UTI in young women, it is estimated that about 35% of healthy women suffer symptoms of UTI at some time in their life (Lee, 2007). For asymptomatic bacteriuria, it is found in 1-2% of girls aged between 4-12 years and 3-5% of women aged between 18-45 years old. However, symptomatic infections are rare in girls under 13 years of age, but the incidence increases during adolescence, which was 0.5-0.7 per person-year. This can be correlated with the frequency of vaginal intercourse. The theory underlying the hypothesis that sexual intercourse promotes UTI is that vigorous and frequent sexual activity traumatizes the female urethra and forces bacteria into the bladder. Furthermore, the incidence of UTI was found increases in the elderly as well since increase colonization of the skin with Gram negative organisms occurs with increasing age and debilitation (Lee, 2007).

1.1.5 Complication of UTI

When treated promptly and properly, UTI is rarely lead to complications. However, if it is left untreated, UTI can have serious consequences. This include renal scarring, recurrent infections, especially in women who experience three or more UTI, permanent kidney damage from an acute or chronic kidney infection (pyelonephritis) due to an untreated UTI, increased risk of women delivering low birth weight or premature infants, and also systemic arterial hypertension (Harmsen *et al.*, 2007; Sinha & Postleth 2003; Habib 2012).

1.2 Problem Statements

UTI is the widely spreading infections seen in hospital settings, and the second commonest infections seen in the general population. According to Mar (2010), UTI is very common among otherwise healthy women with a very high number experience symptoms and will have sought treatment before the age of 40 (Mar, 2010). Symptoms suggestive of UTI are the reason for 0.5-1% of consultations, and each year about 5% of women present to their general practitioner with painful urination called dysuria and frequency (Lee & Neild, 2007).

It is acknowledged that, UTI is one of the most important community-acquired infections and recurrence is common, particularly among women. Among sexually active female, urinary symptoms are the common reasons for outpatient visits. Other studies also reported that 20% of adult females have concomitant vaginal or cervical infections with sexually transmitted organisms. This is because UTI and sexual transmitted disease (STI) share similar risk factors such as sexual contact and this is also applied to adolescent in the western countries (Huppert *et al.*, 2007). Therefore, awareness about healthy sexual activity is important to be emphasized to housewives in order to prevent UTI as well as STI.

Okonko *et al.* (2008) and Roopa (2011) reported that UTI is among the most common bacterial infections in humans in both the community and hospital in all age groups of both sexes. It is a serious health problem affecting millions of people each year and is the leading cause of Gram-negative bacteriaemia (Okonko *et al.*, 2008).

Moreover, UTIs are also the leading cause of morbidity and health care expenditures in persons of all ages group. Criteria for the diagnosis of UTI also vary greatly depending on the patients and context (Okonko *et al.*, 2008). Malnutrition, poor hygiene, low socio-economic statuses are found to be the associated for UTI and these factors are rife in rural settings (Roopa, 2011).

Although UTI is very common in women and may lead to serious health problems if not treated well, it has been proved that many women did not take it seriously (Leydon *et al.*, 2010). Women prefer to self-manage their UTI attending a general practitioner will be their last decision. Most women thought that UTI is not a health problem that requires

treatment. Some of them ever ignored the most basic symptom such as blood in the urine become they thought it may associate with menstruation or menopause. Thus, they delay reporting this symptom to their physicians (Leydon, *et al.*, 2010).

There are a few published studies on UTI in Malaysia but however, at this stage, the researcher could not found any study that specifically focus on housewives and those who live in the rural area (Teng *et al.* 2011; Loh & Sivalingam, 2007). Moreover, based on the researcher's field work interviewing several women in a community setting, she found that the delivery of health education by the health professionals at community health center did not cover a topic on UTI. All these issues have inspired the researcher to conduct a study on UTI among housewives in a community setting in Kelantan. Thus, this study will be the first study to explore the prevalence of UTI among housewives.

A theoretical framework that was used in this study was the Health Belief Model (HBM). It is used to help explain how changes and maintenance of health related behaviors guides health behavior interventions (Champion & Skinner, 2008). This theoretical framework is one of the longest established theoretical models (Nutbeam & Harris, 2002). It has been developed in the 1950s by a group of U.S. Public Health Service social psychologists to explain why so few people were participating in programs to prevent and detect disease (Champion & Skinner, 2008). The HBM is good to address problem behaviors that evoke health concerns (Croyle, 2005). For this study, HBM was used to illustrate the housewives' beliefs about their health and actions to improve a good and better health.

1.3 Research Objectives

1.3.1 General Objective

The objective of this research is to assess the awareness of urinary tract infections (UTI) among housewives in Kampung Kedai Mulong, Kota Bharu, Kelantan.

1.3.2 The specifics objectives of this study are:

1. To determine the prevalence of UTI among the housewives in Kampung Kedai Mulong.
2. To identify the associated factors of UTI among the housewives.
3. To determine the association between the housewives' selected demographic data (age, education level, family income) and the prevalence of UTI.
4. To determine the association between the housewives' awareness level and the prevalence of UTI.
5. To determine the association between the housewives' personal hygiene level and the prevalence of UTI.

1.4 Research Questions

This study was guided by six research questions as follows:

1. What is the prevalence of UTI among housewives in Kampung Kedai Mulong, Kota Bharu, Kelantan?
2. What are the associated factors of UTI among the housewives?
3. Are there any association between the housewives' selected demographic data and the prevalence of UTI?
4. Are there any association between the housewives' awareness level and the prevalence of UTI?
5. Are there any association between the housewives' personal hygiene and the prevalence of UTI?

1.5 Research Hypothesis

1) Null hypothesis, Ho: There is no significant association between selected demographic characteristics (age, education level, family income) among housewives and prevalence of UTI.

Alternative hypothesis, H_A: There is a significant association between selected demographic characteristics (age, education level, family income) among housewives and prevalence of UTI.

2) Null hypothesis, Ho: There is no significant association between awareness level among housewives and prevalence of UTI.

Alternative hypothesis, H_A: There is a significant association between awareness level among housewives and prevalence of UTI.

3) Null hypothesis, Ho: There is no significant association between personal hygiene among housewives and prevalence of UTI.

Alternative hypothesis, H_A: There is a significant association between personal hygiene among housewives and prevalence of UTI.

1.6 Definition of terms

1.6.1 Awareness

Awareness is a knowledge or understanding of a subject, issue or situation (Macmillan Dictionary, 2012). While in the Oxfort Learner Dictionary (2011), awareness refers to knowing something, knowing something that exists and important, and being interested in something.

1.6.2 Urinary tract infection

It is refers to an infection in the urinary tract. Infections are caused by microbes that are the organisms too small to be seen without a microscope including fungi, viruses, and bacteria. Bacteria are the most common cause of UTIs. Normally, bacteria that enter the urinary tract are rapidly removed by the body before they cause the symptoms. However, sometimes bacteria overcome the body's natural defenses and cause an infection. An infection in the urethra is called urethritis whereas a bladder infection is called cystitis. Bacteria may travel up the ureters to multiply and infect the kidneys. A kidney infection is called as pyelonephritis (Lee & Neild, 2007).

1.6.3 Housewife

Housewife is a married woman with the main task is caring for her family, managing household affairs, and doing housework (Oxford dictionary, 2013). Meanwhile according Cambridge Advanced Learner's Dictionary (2013), housewife is a woman whose work is inside the home, doing the cleaning, cooking, and who usually does not have any other job (Cambridge Advanced Learner's Dictionary, 2013).

1.6.4 Prevalence

Prevalence is the proportion of individuals in a population that having a disease or characteristic. Prevalence is a statistical concept referring to the number of cases of a disease that are present in a particular population at a given time. Often, 12-month prevalence (or some other type of "period prevalence") is used in conjunction with lifetime prevalence. The word is often used to describe a phenomenon that is widespread in a community, like the prevalence of a disease across a country (MedicineNet.com, 2012).

1.6.5 Associated factor

Associated factor can be defined as a constituent or element that brings about certain effects or results, that indicates a specific multiple, number, or quantity as well as one of the elements that will contributing to a particular result or situation (businessDictionary.com, 2013).

1.6.6 Personal hygiene

Personal hygiene involves properly caring for the body by keeping it clean and healthy while allowing people to look and feel best. It is also refers to one's conditions and practices that serve to promote or preserve one's health. According to the Pennsylvania Department of Public Welfare, it is also a highly effective way to protect from illness and infection (Anderson, 2013).

1.6.7 Community setting

Community setting is a group of people living in the same place or having a particular characteristic in common. The people of a district or country considered collectively, especially in the context of social values and responsibilities. There are a group of people who live in the same area (such as a city, town, or neighborhood) and an interacting population of various kinds of individuals (as species) in a common location (Oxford dictionaries, 2013).

1.7 Significance of the Study

This study will benefit for women in the community as well as the healthcare professionals (HCP), who involves directly with the care of women in the community. There is no study of UTI that has been conducted on this group of people, who are susceptible to have UTI. This study was to determine the prevalence of UTI, associated factors of UTI and to assess the awareness regarding UTI among housewives who lives in a rural area.

It is hope that the study helps to improve women's knowledge and raise their awareness regarding UTI and the findings served on the basis information for future UTI. The finding of this study will also use to help and improve the quality of health care delivery for those in the community.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The literature search for this study covers a period between September 2003 to February 2014 that revealed English language listings articles in nursing and medical journals. Several data that was used include Medline, PROQuest, Sciencesdirect, Ebscohost, and Journal Online by looking at the keywords such as urinary tract infection (UTI), unemployed women, community, housewife and nursing. This chapter review the current literature that related to UTI in women with the intention justify as well as determine the research design and tools required to achieve its objectives. Aspects that were covered in this chapter include the prevalence, associated factors, etiology, symptoms, complication, treatment, and strategy to deal with UTI.

2.2 Urinary Tract Infection

Habib (2012) state that UTI is defined as bacterial infection that affects part of urinary tract. Besides bacteria, UTI can also caused by other infectious agents such as viruses and fungi (Habib, 2012). Meanwhile, Nicolle (2013) stated that UTI can be presented as the clinical syndromes of acute, uncomplicated, urinary infection, that included acute non-obstructive pyelonephritis, complicated UTI, asymptomatic bacteriuria, and also in men, bacterial prostatitis. Actually, severe or life-threatening infection usually occurs with complicated urinary infection. Complicated urinary infection occurs in men and women with functional or structural abnormalities of the urinary tract themselves (Nicolle, 2013).

2.3 Prevalence of UTI

Oladeinde *et al.*, (2011) in a Nigerian study on 514 patients (49 males & 465 females), reported that the prevalence of UTI in Okada, a rural community was significantly higher in females compared to males (female vs. male: 42.80% vs. 10.20% OR = 6.583, 95% CI = 2.563, 16.909%, $p < 0.0001$). Females had 3 to 17 fold increase risk of acquiring UTI, than their male counterpart and *Escherichia coli* was the most predominant organism causing UTI in females (Oladeinde *et al.*, 2011).

In addition, a cross-sectional intervention study by Roopa (2011) in Karimnagar, Andhra Pradesh, the study was conducted on 75 working women, 75 housewives and 180 adolescent girls using a structured questionnaire. The prevalence rate of UTI in this study was 23(13%), 22(29%) and 16(21%) respectively (Roopa, 2011).

Tsiouris and Lowry (2004) stated that it is acknowledge that UTIs are commonly affects women as compared to men and the prevalence rates increases in women from adolescent to adulthood. Most of the study of UTI previously focuses mainly on prevalence and incidence of UTI in adult female population (Foxman, 2002; Timur-Tashan, Beji, Aslan & Yalcin, 2012). The aims of the studies were commonly to determine associated risk factors of UTI among female population which is useful as the references for the current study (Timur-Tashan *et al.*, 2012), (Wenju *et al.*, 2005). Other than that, Teng *et al.* (2011), in their study to assess the antibiotic prescribing rates and antibiotic choices for upper respiratory tract infections (URTI) and UTI in Malaysia primary care by randomly selected primary care clinics in Malaysia. Another study of UTI in Malaysia is by Loh & Sivalingam (2007) that assess UTI in pregnancy women associated with significant morbidity for both mother and baby. There are no finding of any study that specifically assessing about awareness among housewives by a researcher.

2.4 Etiology of UTI

Most UTI is caused by bacteria, and *Escherichia coli (E. coli)* is the most common uropathogen detected in about 70-95% cases. *Staphylococcus saprophyticus* is isolated in 5–20% of cases, and other occasional pathogens include *Proteus mirabilis, Klebsiella species, ormenterococci.* This distribution is true for community-acquired infections. Meanwhile for hospital-acquired infections or infections complicated by underlying host factors tend to be polymicrobic and multi-drug-resistant. Some organisms that may rarely cause disease in a healthy woman may cause significant disease in patients who are compromised anatomically and immunologically. For example, those who are elderly or catheterised or have diabetes or a neurogenic bladder. *E. coli* still accounts for 50% of isolates, with 15% being *Enterobacter faecalis*. The remainder include *klebsiella, enterobacter, citrobacter, serratia, pseudomonas, providencia, enterococcus,* and *Staphylococcus epidermidis* (Franco, 2005).

2.5 Associated factors of UTI

There were several factors associated to UTI such as fluid intake, delay in voiding and defecate process, caffeinated beverages and also constipation that will be discussed further in this section. According to Stauffer *et al.*, (2004), reduction in intake of fluids was highly related to UTI. This is because of the impaired of elimination of bacteria from the bladder itself. Constipation also influence the frequency and severity level of UTI because of the voiding dysfunction that includes infrequent voiding (Conway & Keren, 2009).

Bacterial eradication from the urinary tract is partially dependent on urine flow and voiding frequency. Therefore, it seems logical to postulate a connection between fluid intake and the risk of UTI. Beetz (2003) also emphasized that only few clinical studies producing contradictory results are available on the influence of fluid intake concerning the risk of UTI. One explanation for the inconsistency between the data might be the uncertainty about the exact amounts of fluid intake, which was mostly recorded in questionnaires. So far, there is no definitive evidence that the susceptibility for UTI is dependent on fluid intake (Beetz, 2003).

According to Vincent *et al.*, (2013), caffeinated consumption was associated factors that related to UTI. Among 180 young women in Florida revealed that the uptake of caffeinated drinks more than two glasses each day cause high prevalence of UTI (Vincent *et .al*, 2013). Besides that, in term of delay in urination process, Stauffer *et al.*, (2004) stated that the longer interval between the bladder emptying will increase the probability for bacterial multiplication in the body.

2.6 Symptoms of UTI

The symptoms of UTI varies depending on the location of infection and the age group of infected person. Acute cystitis symptoms include dysuria, frequency, urgency, and suprapubic discomfort. The urine is discoloured, appears hazy and may be offensive. Microscopic haematuria is often present. Actually, cystitis is not a systemic infection and therefore, patients are not febrile and should not exhibit an elevated C-reactive protein (CRP) or erythrocyte sedimentation rate (ESR). For acute urethritis, it is associated with dysuria and urethral discharge. If the upper tract is involved, there may be fever or renal angle tenderness, loin pain and haematuria (Lee & Neild, 2007).

In terms of age group, young women with acute dysuria usually have acute cystitis, acute urethritis or vaginitis. For recurrent UTI in healthy women, it is associated with underlying genetic factors and acquired behavioural host factors (Lee & Neild, 2007). While for the elderly, they may also experience a general feeling of being unwell and confusion. The latter infections (nonspecific urethritis) are often asymptomatic, and the organisms become permanent commensals (Lee & Neild, 2007).

An important aspect of history taking is to take a detailed account of the patient's previous episodes of UTI. The number of episodes per year, any triggering factors, and also previous antibiotic treatment (in particular the dosage, duration, effectiveness, and any side-effects) should be reviewed. Besides that, suprapubic tenderness may be present. If the upper tract is involved, there may be fever or renal angle tenderness. Other risk factors should also be assessed (Franco, 2005).

2.7 Complications of UTI

Normal UTI affecting the urethra or bladder do not pose any additional health risks. However, if the infection moves along the urinary tract and infects the kidneys, it may lead to a more dangerous complications. A kidney infection may cause lower back pain, high fever, chills, nausea and vomiting. If left untreated, the infection can become chronic and cause permanent damage to the kidneys. Some of the considerable complication of UTI reported in several previous studies include renal scarring, adverse outcomes during pregnancy, systemic arterial hypertension and also chronic renal failure that eventually lead to end stage renal disease (ESRD) (Harmsen *et al.*, 2007; Sinha & Postlesh 2003; Habib, 2012).

Furthermore, Heffner & Gorelick (2008) stated that UTI may cause immediate and long term morbidity including hypertension, renal scaring, preeclampsia and end-stage renal disease if left untreated (Heffner & Gorelick, 2008). Thus, a thorough assessment is required to determine the difference. One of the important aspects of history taking is to take a detailed account of the patient's previous episodes of UTI. The number of episodes per year, any triggering factors, and also previous antibiotic treatment (in particular the dosage, duration, effectiveness, and any side-effects) should be reviewed. Once diagnosed, prompt and appropriate antibiotics as well as other treatments are required to prevent progression of UTI complications.

2.8 Treatment of UTI

UTI must be detected earlier and treated to avoid complications. Conventional treatment for UTI has principally focussed on eradicating bacterial causes mainly with antibiotic treatment. There are several types of antibiotics that are commonly prescribed to eradicate the infection, such as Amoxicillin, Ciprofloxacin, or Levofloxacin (Mar, 2010).

Additionally, Barber *et al.*, (2013) revealed that self-initiated antibiotics are also useful for women with frequent recurrent infections. After diagnosing themselves based on symptoms and/or a urine dipstick, they can initiate about a three day regimen of antibiotic without needing to visit a physician (Barber *et al.*, 2013).

A study by Lipovac *et al.* (2007) was conducted to evaluate the efficacy of vesicle instillation of hyaluronic acid aganist recurrent UTI on 20 women's with recurrent UTI. The results shows that the number of infections per year per patient was reduced from 4.99+/-0.92 to 0.56+/-0.82 (p<0.001). In women with recurrences, time to recurrence was 178.3+/-25.5 days, compared with 76.7+/-24.6 days before treatment (p<0.001). Thus, researcher concluded that Intravesical instillation of hyaluronic acid is effective in preventing recurrent urinary tract infections (Lipovac *et al.* 2007). Therefore, if it is not be treated earlier, women will get consequences or complication.

2.9 Strategy to deal with UTI

There are several strategies used by women to prevent UTI. This is particularly on dietary and behavioral modification. For example in a study to assess the effectiveness of cranberry and blueberry products in preventing recurrent symptomatic UTI in women, cranberry products was found as significantly reduced the incidence of recurrent UTIs in 12 months (overall relative risk 0.65, 95% CI 0.46-0.90) compared with control (Roopa, 2011).

Other randomized controlled trials also reported that cranberry juice may decrease the number of symptomatic UTI over 12 months period (Lee & Neild, 2007). While in a study conducted in Finland on 139 womens with UTI and 185 womens without UTI, they found that frequent consumption of fresh juices, especially berry juices, and fermented milk products containing probiotic bacteria was associated with a decreased risk of recurrence of UTI (Lee & Neild, 2007).

Other than that, for those that frequently experience constipation, it is advisible to treat that problem because constipation may cause increase in abdominal pressure during physical activity or defeacation process. As a result, it will increase the bladder pressure and urethral mobility that interrupts the normal flora, thus will leads to UTI (Wenju *et al.*, 2005).

In terms of behavioral modification, women are encouraged to wipe dry the perineal area from front to back after urination and defecation to reduce the risk of cross-infection. Women are also advice to limit the use of feminine products such as deodorant sprays, as these can irritate the urethra that increase the risk of infection. Besides that, women should be informed that urinate immediately after having sexual intercourse to help flush out any bacteria that may try to enter the urethra (Lee & Neild, 2007).

2.10 Conceptual/Theoretical Framework

The Health Belief Model (HBM) was used in this study to help guide the researcher to understand more about the awareness of UTI. In the earlier years, it was used to explain the widespread failure of peolpe to participate in prevention and screening programs of particular diseases. The HBM is a popular model applied in nursing, especially in issues focusing on patient compliance and preventive health care practices. The model was then improved and evolved gradually and being used to explain people's responses to symptoms, behavior in response toward illness and also adherence to medical regimens (Champion & Skinner, 2008).

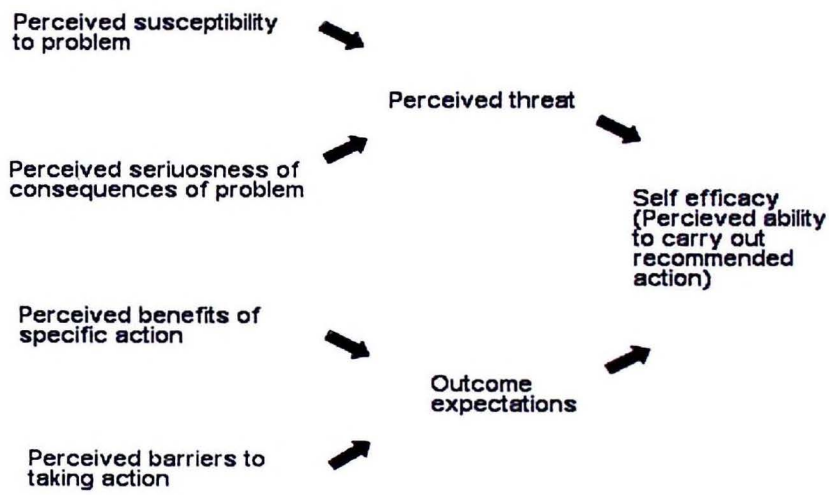

Figure 2.1: Conceptual Framework of UTI (adopted from Champion & Skinner, 2008)

The model postulates that health-seeking behaviour is influenced by a person's perception of a threat posed by a health problem and the value associated with actions aimed at reducing the threat (Figure 2.1). The HBM also addresses the relationship between a person's beliefs and behaviors. Moreover, it provides a way to understand and predict how clients will behave in relation to their health and how they will comply with health care therapies (Marriner & Raile, 2005).

The HBM addresses four major components for health action that are perceived barriers of recommended health action, perceived benefits of recommended health action, perceived susceptibility of the disease, and perceived severity of the disease (Figure 2.2). In addition, there are modifying factors that can affect behavior compliance. Modifying factors would include media, health professionals, personal relationships, incentives, and self-efficacy of recommended health action (Turner *et al.*, 2007). Besides that, Nutbeam & Harris (2002) also emphasizes that modifying factors such as personal characteristics, social circumstances and immediate cues for action such as media publicity or personal experiences, are all play important roles in order to determining action of an individual.

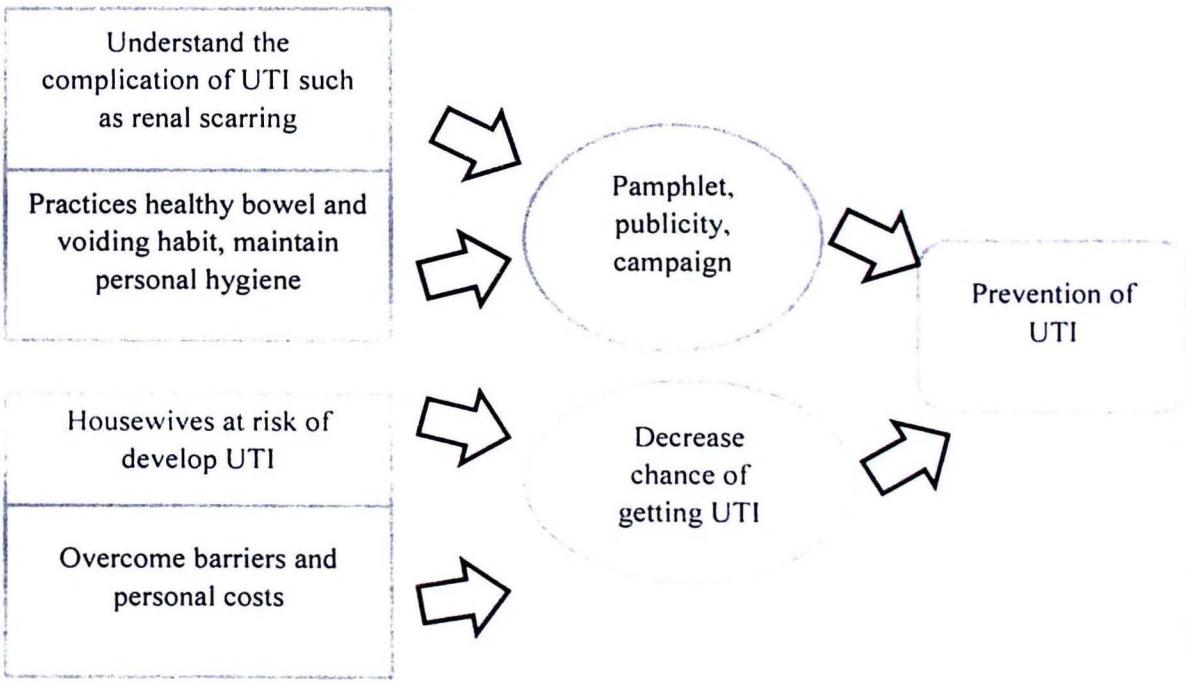

Figure 2.2: Conceptual Framework of UTI [Modified from HBM (Wan Hasnimazmira, 2014)]

By considering all these information, the researcher decided to apply this model study to help understand housewives attitude or behavior towards UTI. Based on this model, the researcher assumed that housewives need to have adequate knowledge and awareness about UTI and it is about preventable and treatable. With this knowledge, they will understand that they are at risk for UTI and will take precaution earlier with preventative actions in order to avoid UTI or will seek for treatment once they experience the symptoms. It is the researcher's intention part to challenge this model through the finding of this study.

CHAPTER 3

RESEARCH METHODOLOGY AND METHODS

3.1 Introduction

This chapter including all the information about the study in term of research design, setting of the population study, the sample use in this study, sampling method, variables, instrumentation, and also ethical consideration.

3.2 Research Design

This study was conducted through a cross-sectional survey with descriptive in nature. Through this design, the researcher was able to full-fill the objectives to assess the awareness of urinary tract infections (UTI) among housewives in Kampung Kedai Mulong, Kota Bharu, Kelantan. Cross-sectional studies are carried out at one time point or over a short period. They are usually conducted to estimate the prevalence of the outcome of interest for a given population, commonly for the purposes of public health planning (Hall, 2008).

3.3 Population and Setting

The population of the study was among housewives at Kampung Kedai Mulong, Kota Bharu, Kelantan. This setting was selected because it was situated at a rural area and has a health clinic with adequate numbers of visits by women that can fulfill the inclusion criteria of the current study. The housewives in Kampung Kedai Mulong were selected to represent housewives who lives in a rural area because they are housewives and living in rural area. They might have limited exposure to the information that related to UTI. Thus, it was the researcher's intention to challenge this idea. The housewives with husband who still alive were chosen as the respondent of this study because one of the factors that most strongly linked to UTI in almost all studies is sexual intercourse (Franco, 2005). Besides that, the range of age was between 18 to 49 years old were selected because it is known as reproductive age as UTI often occur in relation to intercourse which is a common problem in this group of women (Salonia *et al.*, 2013).

3.4 Sampling Plan

3.4.1 Sample

The sample of this study was among housewives living in Kg Kampung Kedai Mulong, Kota Bharu, Kelantan who fulfilled the inclusion criteria as follows:

3.4.1.1 Inclusion criteria:

1. Resident of Kampung Kedai Mulong, Kota Bharu, Kelantan.
2. Age between 18-49 years old.
3. Housewives and husband who are still alive.
4. Able to read and write in Bahasa Melayu.
5. Not illiterate.
6. Agreed to participate in the study.

3.4.1.2 Exclusion criteria

1. Resident of other village.
2. Aged below 18 or above 49 years old.
3. Employed women.
4. Illiterate.
5. Disagreed to participate in the study.

3.4.2 Sampling Method

Respondents for this study were selected through non-probability sampling which was convenience sampling technique that focuses based on the judgement of the researcher. A convenience sample is a simply one where the respondents that are selected for inclusion in the sample are the easiest to access. Convenience sampling includes respondents who are readily available and agree to participate in a study (Berinstein, 2003). By using this method, the respondent was selected from the sampling frame by going home by home for the respondent that fulfill all the inclusion criteria and the questionnaires were self-administered by the researcher after verbal and written explanation about the study was given to them until achieve the identified sample size.

3.4.3 Sampling Size

The researcher was not include all housewives in this study because the selected sample size had represents the overall population. The calculation of sampling size for this study was estimated by using single proportion formula:

$$n = (z\alpha/ \Delta)^2 p(1-p)$$

The parameters were as follows:-

$$z = 1.96$$

$$\Delta = 0.1$$

p =0.29 (The prevalence rate of UTI among housewives in Karimnagar, Andhra Pradesh)(Roopa, 2011).

$$n = (1.96/ 0.1)^2 \times 0.29(0.71)$$

$$n = 384.16 \times 0.2059$$

$$n = 79$$

The minimal sample size was 79 and after considering 20% drop out, the calculated sample size was 95.

$$n = 79 + 20\% \text{ drop out}$$

$$n = 79 + 16$$

$$n = 95$$

Thus, the total calculated sample size for this study was 95 respondents.