

CHAPTER 1

Introduction

Background and Significance of the Research Problem

Urinary tract stone disease is the third most common clinical disorder in urinary tract system (Papadoukakis, Stolzenburg, & Truss, 2006). The prevalence of urinary tract stone formation varies throughout the world with 1-5% in Asia, 5-9% in Europe, 13% in North America and 20% in the Arabian countries (Ramello, Vitale, & Marangella, 2000). In recent decades, changes in lifestyle and economic status have increased the prevalence of urinary tract stone globally, especially upper urinary tract stone (Al-Eisa, Al-Hunayyan, & Gupta, 2002; Lopez & Hoppe, 2010; Romero, Akpinar, & Assimos, 2010; Trinchieri, 2008).

In the United States, incidences of 1,116 per 100,000 were reported among population aged between 18 to 64 years old in 2000 (Saigal, Joyce, & Timilsina, 2005). This trend is gradually increasing as the latest report indicates a prevalence of 8.8% and was reported affect approximately 1 in 11 people in the United States (Scales, Smith, Hanley, & Saigal, 2012). Similar trends are also occurring in European countries such as German, Italy and Iceland (Hesse, Brändle, Wilbert, Köhrmann, & Alken, 2003; Romero et al., 2010). In Iceland, the total incidence of urinary tract stone among adults aged 18 and above rose significantly from 108 per 100,000 in the first 5-year interval to 138 per 100,000 in the last interval of the study (Edvardsson, Indridason, Haraldsson, Kjartansson, & Palsson, 2013).

Asian countries have shown similar increasing trends in prevalence and incidence of urinary tract stone. The annual incidence of urinary tract stone in Japan increased from 54.2 in 1965 to 134.0 per 100,000 in 2005 (Yasui, Iguchi, Suzuki, & Kohri, 2008). In northeast Thailand, the prevalence of urinary tract stone was reported to be over 30 per 1,000 with the incidence rate 8.4% (Yanagawa et al., 1997). This concur with the

latest study that showed a high incidence of the disease in the same area (Tosukhowonga et al., 2007). Meanwhile, in southern Thailand, the incidence of urinary tract stone was found to be 183.8 per 100,000 (Tanthanuch, Apiwatgaroon, & Pripatnanont, 2005).

In Northeast Malaysia, the prevalence of urinary stones in 1980 is 33.3 per 100,000 for every 5 year and showed increasing in trend with latest prevalence is 9.8 per 100,000 in 1997 (Nazmi, Zainal, & Hashim, 1997). However, the incidence rate of urinary tract stone in Malaysia is unclear. An annual statistic per 100,000 population, according to Malaysia's Health Indicator, recorded that there were 8,266 and 8,030 urinary tract stone patients who were discharged from government hospitals in 2007 and 2008 respectively (Ministry of Health Malaysia [MOH], 2007, 2008). These numbers slightly decreased but the trends for 2009, 2010 and 2012 remained the same with 7,892, 7,847 and 7,848 urinary tract stone patients were discharged from government hospitals respectively (MOH, 2009, 2010, 2012). These statistics however only picture the situation in government hospitals and do not include statistics from private hospitals and teaching hospitals which is believed to be higher than recorded.

Overall data above showed an increasing incidence of urinary tract stone worldwide which contributes to a rising economic burden and health problem. This disease is very costly health problem which involve cost of treatments and disease complication. In Malaysia, the average patient's cost for hospital admission and subsequent visit to day care center after urinary tract stone removal procedure such as Extracorporeal Shock Wave Lithotripsy (ESWL) and Uteroscopy (URS) account to approximately MYR 128.50 (USD 35.28) and MYR 289.62 (USD 79.53) which excludes costs for transportation and drugs (Izamin, Aniza, Rizal, & Aljunid, 2009). The costs of this disease also associated with comorbidity such as obstruction in upper urinary tract system caused by the stone that can lead to kidney damage by blocking the flow of urine, impairing kidney function in getting rid of body waste and finally cause renal failure or kidney loss (Muhbes, 2012). In east Peninsular Malaysia, 70% of patients with urinary tract stone who underwent treatment for kidney stones progressed to chronic renal failure which required additional treatment such as hemodialysis (Nazmi et al., 1997). Chronic complication from urinary tract stone such as renal failure

has greater implications for government hospitals in Malaysia as the costs for maintenance of hemodialysis, excluding the cost of machines and services, are approximately MYR 2700 (USD 1000) per month (D'Cruz & Chandrasekharan, 1990).

Generally, surgical treatment became the most favorable option in urinary tract stone removal among urologists compared to medical management. In Malaysia, surgical treatment such as ESWL and URS are the most common management for stone removal with the success rate for ESWL group and URS group being 81.1% and 84.6% respectively (Izamin et al., 2009). However, despite the huge success of surgical management in treating this disease, the recurrence rate of urinary tract stone is still significantly high and becomes a major urologic and economic concern. In general, the recurrence rate after the first stone removal is approximately 10% within 1 year, 35% within 5 years (Wilkinson, 2001) and 50% within 10 years without preventive measurement such as dietary modification after stone removal (Trinchieri et al., 1999). Meanwhile, the recurrence rate of urinary tract stone among former patients is approximately 13.9% within 46 months after surgical treatment (Kosar et al., 1999). In Malaysia, a study on metabolic evaluation among stone 30 former patients found that 27% of both genders experienced at least one episode of recurrence during the 6 - months of study duration even though all of them consumed enough fluid intake as a primary prevention strategy (Hong, Dublin, Razack, Mohd, & Husain, 2012).

Prevention of urinary tract stone involves several strategies such as balanced diet and lifestyle modification including body weight control and adequate physical activity (Pearle et al., 2014). This is because the formation of urinary tract stone and its recurrence is influenced by multiple yet complex factors such as genetics, age, gender, dietary behavior, metabolic disorders and climate factors (Koyuncu, Yencilek, Eryildirim, & Sarica, 2010; Lopez & Hoppe, 2010). However, dietary behavior has been pointed out as one important factor that may contribute to the risk of urinary tract stone recurrence among former patients in many studies (Borghesi et al., 1996; Borghesi et al., 2002; Meschi et al., 2012).

Dietary behavior is an ingestion of foods and fluid (Furman, 2012). Dietary behavior which includes diet and fluid intake is believed to play an important role in increasing incidence, prevalence and recurrence of urinary tract stone (Agarwal, Singh,

Mavuduru, & Mandal, 2011; Curhan, Willett, Knight, & Stampfer, 2004; Leonetti, Dussol, Berthezene, Thirion, & Berland, 1998). Diet plays a major role in the pathogenesis of the most widespread forms of urinary tract stone such as calcium and uric acid stone with calcium oxalate being the most common compound in the formation of calcium-based stones (Hall, 2002; Holmes, Goodman, & Assimos, 2001). An unbalanced diet or particular sensitivity to various foods in former stone patients can lead to urinary alterations such as hypercalciuria and hyperoxaluria which can contribute to the formation or recurrence of kidney stones (Meschi et al., 2004). Therefore, a multicomponent diet consisting of normal calcium, low sodium and low animal protein intake was shown to be beneficial in preventing stone recurrence than a low calcium diet where the recurrent rate of calcium oxalate stone among men is 20% versus 38% at 5 years respectively (Borghi et al., 2002). In Malaysia, unhealthy dietary behavior such low consumption of milk products and low sodium intake may have contributed to low calcium excretion among the subjects which increased risk of urinary tract stone recurrence (Hussein, Sadiq, Kamaliah, Norakmal, & Gohar, 2013). In general, diet to prevent urinary stone and its recurrence are limit animal proteins, limit sugar intake, limit fat intake, normal calcium intake, limited oxalate intake, reduced sodium chloride intake, increased alkaline potassium intake, increased vegetable fiber intake and increased water intake (Finch & Irving, 2007; Pearle et al., 2014).

Fluid intake also one of the most important components in dietary behavior to prevent urinary tract stone formation and its recurrence (Borghi et al., 1996; Meschi et al., 1999). A low urine volume is an important risk factor in urinary stone formation, thus increasing fluid intake could inhibit stone formation by lowering the urinary concentration of stone formation (Siener & Hesse, 2003). A single randomized controlled trial (RCT) found that a high fluid intake among recurrent calcium oxalate stone former patients compared to a group who given no specific recommendation reduced the stone recurrence rates by 12% versus 27% at 5 years respectively (Borghi et al., 1996). For this reason, dietary measures including diet and fluid intake remain the first level of strategy in prevention of urinary tract stone recurrence (Saxena & Sharma, 2010; Xu, Zisman, Coe, & Worcester, 2013). Patients will be able to prevent recurrence of urinary tract stone if they practice good food and fluids intake as recommended. However, the successful of patients' dietary behavior are influenced by their belief.

According to the Health Belief Model (HBM), health behavior is influenced by personal beliefs about the disease (Rosenstock, 1974). The HBM predicts that beliefs about specific illness and their preventive health behaviors impact the likelihood of performing these behaviors (Rosenstock, 1974; Strecher & Rosenstock, 1997). Based on the HBM, perceived benefits and perceived barriers were found to influence fluid intake behavior among former stone patients to prevent recurrence of urinary tract stone compared to other constructs in the HBM (McCauley, Dyer, Stern, Hicks, & Nguyen, 2012). The applicability of the HBM has also been reported to predict the dietary behavior in many populations with perceived benefits and barriers becoming a central construct to promote behavioral changes (Kloeblen & Batish, 1999; Pires & Mussi, 2012; Salashoori, Sharifirad, Hassanzadeh & Mostafavi, 2014). Moreover, a person is likely to change their behavior if they believe the benefits outweigh the barriers (Agondhi, Gallani, Rodrigues, & Cornelio, 2011; Rosenstock, 1974; Strecher & Rosenstock, 1997). Even though HBM have been tested in other population but there is no study among population with urinary tract stone was found to apply the HBM, especially perceived benefits and perceived barriers to predict patients' dietary behavior to prevent urinary tract stone recurrence. Thus, application of HBM in this study is necessary to investigate factors that influenced dietary behavior among persons undergone urinary tract stone removal.

Perceived benefit is defined as a person's belief about the value or usefulness of a new behavior to reduce a threat or illness (Janz & Becker, 1984). In other words, perceived benefit concerns the positive beliefs of an individual towards a particular health behavior that can give them the advantage of decreasing the risk of an illness or disease. The benefits of fluid intake, such as to prevent pain and surgery, that are perceived by the former stone patients were found to increase their motivation to maintain fluid intake in order to prevent a recurrence of urinary tract stone (McCauley et al., 2012). However, more study need to be done as there are limited information related perceived benefits of dietary behavior among urinary tract stone population. There is only one previous study by McCauley et al. (2012) which however only focus on benefits of fluids intake to prevent urinary tract stone recurrence among stone former population. In this study the researcher only focus on perceived benefits of dietary behavior involving food and fluids intake among population undergone urinary tract

stone removal. However, even though former stone patients have high perceived benefits of fluid intake in the prevention of urinary tract stone recurrence, the existence of barriers have a greater impact towards their lack of motivation to comply with the high fluid intake as time passes (McCauley et al., 2012).

Perceived barrier is defined as the potential negative aspects of a particular health action that may act as an obstacle to adopt the recommended health behavior (Janz & Becker, 1984). Identifying and understanding the barriers that are perceived by patients after urinary tract stone removal is important as an existence of barriers could prevent them from engaging in preventive health behavior such as dietary changes to prevent urinary tract stone recurrence (Fritsche & Dotzer, 2012; McCauley et al., 2012; Patel & Mehta, 2014). Even though the current study by Patel & Mehta (2014) did not use HBM as conceptual framework but this study provided information related to barriers perceived by patients with urinary tract stone. According to Patel and Mehta (2014), common perceived barriers engage in recommended dietary behavior to prevent its recurrence in this study were lack of knowledge, forgetting about the diet and lack of information. Other barriers such as socio-economic status and poor social support were also found to inhibit preventive health behaviors among urinary tract stone patients (Hiatt et al., 1996; Zargooshi, 2001).

However, current knowledge about perceived benefits and barriers to dietary behavior in prevention of urinary tract stone recurrence is very limited, particularly in Malaysia. Moreover, previous studies which were done among population with urinary tract stone and stone formers only concerned about perceived barriers on fluid or diet behavior separately. Those findings might differ from the barriers to dietary behavior which includes both diet and fluid intake perceived among persons undergoing urinary tract stone. In addition, perceived benefits might provide beneficial information to predict dietary prevention behavior among this population. Thus, in this study, the researcher examined the dietary behavior, perceived benefits of dietary behavior and perceived barriers to dietary behavior and relationship between these variables among persons undergone urinary tract stone removal in Malaysia. Hopefully, knowledge that would be gained about dietary behavior, perceived benefits and perceived barriers would be able to help healthcare professionals, especially nurses to design and improve

the current health promotion program to help patients to prevent urinary tract stone recurrence in Malaysia.

Objectives of the Study

1. To examine dietary behavior among persons undergone urinary tract stone removal
2. To examine perceived benefits of dietary behavior among persons undergone urinary tract stone removal
3. To examine perceived barriers to dietary behavior among persons undergone urinary tract stone removal
4. To examine relationship between dietary behavior, perceived benefit and perceived barriers among persons undergone urinary tract stone removal

Research Questions

1. What is level of dietary behavior among persons undergone urinary tract stone removal?
2. What is level of perceived benefits of dietary behavior among persons undergone urinary tract stone removal?
3. What is level of perceived barriers to dietary behavior among persons undergone urinary tract stone removal?
4. Is there any relationship between dietary behavior, perceived benefits and perceived barriers among persons undergone urinary tract stone removal?

Definition of Terms

Dietary behavior is defined as eating patterns involving intake of foods rich in calcium, oxalate, protein, sodium, fruits, vegetables and fluid of the persons after urinary tract stone removal to prevent urinary tract stone recurrence. It was measured by Dietary Behavior Questionnaire for urinary tract stone patients developed by the researcher based on Food Behavior Checklist (FBC), Rapid Eating and Activity Assessment for Patients (REAP) and literature review.

Perceived benefit is defined as understanding of persons undergone urinary tract stone removal regarding positive outcomes of dietary behavior including food and fluid intake to prevent urinary tract stone recurrence. It was measured by Perceived Benefits Questionnaire for urinary tract stone patients developed by the researcher based on Healthy Eating Benefits Scale (HEBS), Decisional Balance Questionnaire (DBQ) and literature review.

Perceived barrier is defined as understanding of persons undergone urinary tract stone removal regarding difficulty or obstacles to engage in dietary behavior prevent urinary tract stone recurrence. It was measured by Perceived Barriers Questionnaire for urinary tract stone patients developed by the researcher based on Healthy Eating Barriers Scale (HEBS), DBQ, Perceived Barriers to Healthy Eating and literature review.

Persons undergone urinary tract stone removal are defined as adult males and females whose urinary tract stone were removed by either surgical or medical treatment and are underwent follows up in the outpatient departments of three government hospitals in Malaysia.

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved