

CHAPTER 4

Findings and Discussion

This chapter concluded the research findings followed by the related discussions based on the research objectives of the study. The findings are presented in five parts with tables and descriptions as follows:

Part I: Demographic characteristic of the participants

Part II: Level of dietary behavior among persons undergone urinary tract stone removal

Part III: Level of perceived benefits to dietary behavior among persons undergone urinary tract stone removal

Part IV: Level of perceived barriers to dietary behavior among persons undergone urinary tract stone removal

Part V: Relationship between dietary behavior, perceived benefits and barriers among persons undergone urinary tract stone removal

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Findings

Part I: Demographic Characteristic of the Participants

The findings showed that majority of the participants were male (64.8%) and (35.2%) were female, aged range from 18 to 64 years old (Mean = 47.51, SD = 9.849). Patients' average BMI was 25.80 (SD = 4.522). Majority of the participants were Malay (85.2%) while most of the participants were married (93.2%). Among the participants, more than half (61.4%) had secondary school level of education. There are 62.5% of them were employed. Most of the employed participants (36.4%) had monthly income MYR 1500 to MYR 3500. A 62.5% of the participants had no family history of urinary tract stone disease. Meanwhile, half of the participants (46.6%) had 2 to 3 times history of stone removal either by surgical procedure or spontaneous passing stone. Majority of the participants (78.4%) had no information regarding type of their urinary tract stone after it was removed from their urinary tract system. Table 4-1 shows the details of the participants' demographic characteristic.

Table 4-1

Frequency and Percentage of the Participants' Demographic Characteristic (n = 88)

Characteristics	n	Percentage
Gender		
Male	57	64.8
Female	31	35.2
Age (Mean = 47.51, SD = 9.849)		
18 – 20	2	2.3
21 – 30	2	2.3
31 – 40	14	15.9
41 – 50	34	38.6
51 – 60	30	34.1
61 - 64	6	6.8

Table 4-1 (continued)

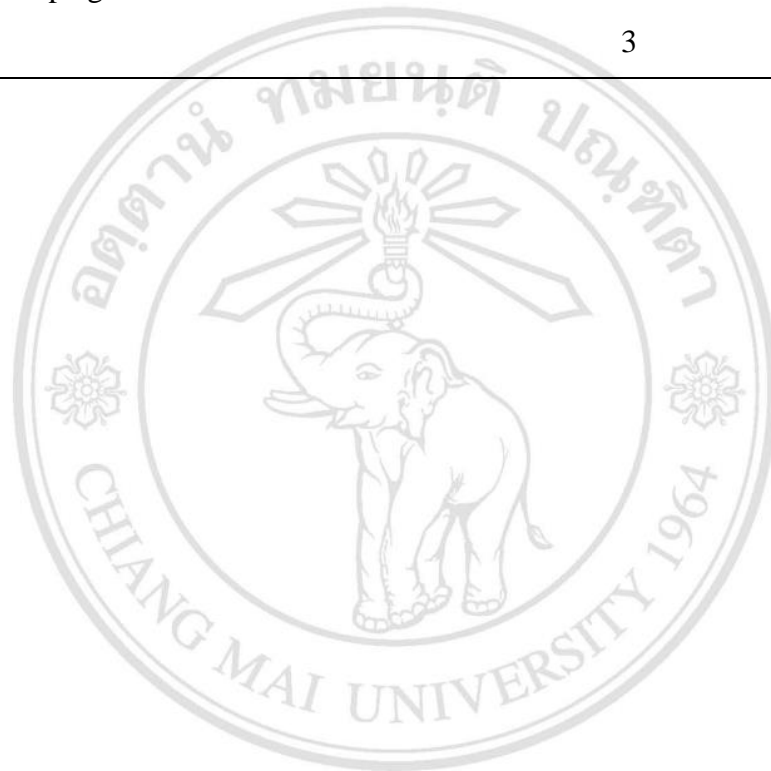
Characteristics		n	Percentage
BMI (kg/m ²) (Mean = 25.80, SD = 4.522)			
Slim	(< 18.5)	4	4.5
Normal	(18.5 - 24.9)	40	45.5
Overweight	(25 - 29.9)	30	34.1
Obese	(>30)	14	15.9
Ethnicity			
Malay		75	85.2
Chinese		8	9.1
Indian		5	5.7
Marital status			
Married		82	93.2
Single		5	5.7
Widowed		1	1.1
Education			
None		1	1.1
Primary		21	23.9
Secondary		54	61.4
College/University		12	13.6
Occupation			
Employed		42	47.7
Government sector		10	11.4
Private sector		3	3.4
Unemployed		8	9.1
Housewife		14	15.9
Retiree (government)		9	10.2
Others		2	2.3

Table 4-1 (continued)

Characteristics	n	Percentage
Monthly income		
None	22	25.0
< RM 1500	14	15.9
RM 1500 - RM 3500	32	36.4
> RM 3500	20	22.7
Family history of stone formation		
No	55	62.5
Yes	33	37.5
History of stone removal/passing stone		
once	35	39.8
2 -3 times	41	46.6
> 3 times	12	13.6
History of illness		
None	41	46.6
Hypertension	21	23.9
Diabetes Mellitus	10	11.4
Heart Disease	1	1.1
Gout	3	3.4
Others	5	5.7
HPT/DM/HD/Gout	5	5.7
Hypertension & Diabetes	1	1.1
Hypertension & Gout	1	1.1
Information of stone type after stone was removed		
No	69	78.4
Yes	19	21.6

Table 4-1 (continued)

Characteristics	n	Percentage
Information regarding stone prevention (diet)		
Doctor & nurse	59	67.0
Doctor, nurse, internet & mass media	15	17.1
Internet & mass media	6	6.8
Health Campaign	5	5.7
Others	3	3.4



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Part II: Level of Dietary Behavior among Persons Undergone Urinary Tract Stone Removal

Table 4-2 summarized the distribution of total score of dietary behavior among participants into three levels. Total mean score for dietary behavior is 61.84 (SD = 5.567) with minimum and maximum score ranged from 50 to 75. Findings showed 78.4% participants had a moderate level of dietary behavior while 21.6% participants had a high level of dietary behavior after undergone urinary tract stone removal procedure to prevent urinary tract stone recurrence.

Table 4-2

Level of Dietary Behavior

Level	Range score	n (%)
Low	18 – 41.99	0 (0.0)
Moderate	42 – 65.99	69 (78.4)
High	66 - 90	19 (21.6)
Total mean = 61.84, SD = 5.567, min score = 50, max score = 75		

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Part III: Level of Perceived Benefits to Dietary Behavior among Persons Undergone Urinary Tract Stone Removal

Table 4-3 presents the distribution of the participants according to level of overall perceived benefits. Total mean scores for perceived benefits is 30.28 (SD = 3.815), with minimum and maximum score ranged from 22 to 40. Findings showed majority of the participants (54.5%) had a moderate level of perceived benefits.

Table 4-3

Level of Perceived Benefits

Level	Range score	n (%)
Low	10 -20.99	0 (0.0)
Moderate	21 – 30.99	48 (54.5)
High	31 - 40	40 (45.5)
Total mean = 30.28, SD = 3.815, min score = 22, max score = 40		

Part IV: Level of Perceived Barriers to Dietary Behavior among Persons Undergone Urinary Tract Stone Removal

Table 4-4 summarized the distribution score of perceived barriers to recommended dietary behavior among persons undergone urinary tract stone removal into three levels. Total mean score for perceived barriers is 34.60 (SD = 3.976), with minimum and maximum scores ranged from 23 to 51. Findings showed majority of the participants (93.2%) had a moderate level of perceived barriers to dietary behavior to prevent urinary tract stone recurrence.

Table 4-4

Level of Perceived Barriers

Level	Range score	n (%)
Low	14 -28.99	4 (4.5)
Moderate	29 - 42.99	82 (93.2)
High	43 - 56	2 (2.3)
Total mean = 34.60, SD = 3.976, min score = 23, max score = 51		

Part V: Relationship between Dietary Behavior, Perceived Benefits and Barriers among Person Undergone Urinary Tract Stone Removal

Bivariate correlation analysis was used to determine relation between dietary behavior, perceived benefits and barriers as presented in Table 4-5. Dietary behavior showed no association with perceived benefits, which means perceived benefits did not influence participants' dietary behavior. Therefore, Pearson correlation showed that dietary behavior was slightly significantly negative correlated with perceived barriers ($r = -.271, p = .011$).

Table 4-5

Bivariate Correlation Between Dietary Behavior, Perceived Benefits and Barriers
($n=88$)

	Perceived benefits	Perceived barriers
	Bivariate correlation	
Dietary behavior	.099	-.271*

* $P < .05$

Discussion

The discussion of this study is presented in four parts according to the research objectives and questions.

Level of Dietary Behavior of Persons Undergone Urinary Tract Stone Removal

Findings from this study revealed that majority of the persons undergone urinary tract stone removal had a moderate level of dietary behavior (table 4-2). There were several reasons that might led to this result.

The reason that may contribute to moderate level of dietary behavior in this study may relate to experience in receiving education regarding prevention of urinary tract stone recurrence. Findings from this study revealed that majority of the participants (67.0%) received information regarding diet to prevent urinary tract stone recurrence from unstructured health education program from health care professionals such as nurses and/or doctors or other sources (table 4-1). This information may help participants to practice good recommended diet behavior such as drinking at least 6 to 8 glasses daily which concurrent with standard recommendation of fluid intake. Intake of more than 1.5 L to 2 L or drink at least 6-8 glasses daily would be sufficient in order to prevent formation of urinary tract stone causes by supersaturation of urine (Pak, 2004; Skolarikos et al., 2015). In this study, participants claimed water is the easiest method to practice and remember in prevention of stone recurrence which always have been emphasized continuously by their health care professional during clinic visits. A study by Hong et al. (2012) on metabolic evaluation in Malaysia also explained that all 30 former stone patients in the study followed and practiced good fluid intake behavior during the 6 months duration of the study as results from clear education from their healthcare professionals after they undergone urinary tract stone removal procedure. Meanwhile in a study on knowledge, practice and preventive behavior among urinary tract stone patients by Bakunt (2011) found that majority of the samples (92.7%) who received information concerning stone prevention had increased their knowledge score which later increase their practice personal diet ($p < 0.01$). In addition, patients who received support through an individual nutritional education from their health care professional during the treatment and follow up session were having less risk to

experience recurrence of urinary tract stone as they tend to change their health behavior (Damasio et al., 2014).

Moreover, two clinics in this study also provided health pamphlet that contains dietary information as additional effort to help patients to prevent of urinary tract stone. This effort may help to improve participants' knowledge regarding how to practice recommended dietary behavior. Therefore, even the percentage of the participants who seek information regarding recommended diet to prevent the urinary tract stone from internet and/or mass media was small in this study but it also may help participants to gain more knowledge and change their dietary behavior. Online health care information has found to encourage 53% of stone formers to change their dietary behavior (Traver, Passman, LeRoy, Passmore, & Assimos, 2009).

Level of education may also contribute to a moderate level of dietary behavior among these participants in this study. Almost all the participants in this study had received formal education with majority of them (61.4%) received formal education until secondary high school (table 4-1). This may help participants to understand information given by health care professional during health education related to recommended dietary behavior to prevent urinary tract stone recurrence. In contrary to study by Patel and Mehta (2014), where majority of the samples with poor educational background experienced major barrier to understand information related dietary regime given by the health care professional which results in their poor dietary behavior. Krieger et al. (1996) in a case control study of dietary behavior and behavioral risk factors for urinary tract stone concluded that the difference in dietary behavior may results from increased knowledge with higher level of education. This might explained why majority participants in this study had moderate level but not achieved high level of dietary behavior because majority of the participants only completed high school level.

Social support from family members and friends might also become important reason that contributes to a moderate level of dietary behavior. Family can be primary sources of social support, as well as provide personal hands-on care during the times of illness. Majority of the participants in this study were married (93.2%) and majority of the them did not agreed that their family and/or friend give lack of support to follow

recommended dietary regime and also claimed their family and/or friends did not influence them to eat unhealthy diet (table I1). Living and eating together during meals time is family culture in Malaysia. Findings by Bakunt (2011) found that being married and living with family increased patients' knowledge score and substantially improved patients' personal diet practice score in prevention kidney stone disease ($p < .001$). Spouse's influence on the behavior patients may also encouraging them to adopt a better dietary behavior (Wood, Goesling, & Avellar, 2009)

Socioeconomic status was found to have impact on dietary habit and associated with recurrence of urinary tract stone (Saint-Elie et al., 2010). Findings from this study revealed that majority of the participants in this study were employed (62.5%) and having monthly income between MYR 1500 - 3500 (USD 356.08-830.86) (table 4-1). Majority samples had moderate monthly income (36.4%) and were above poverty line for urban and rural area which are below MYR 840 (USD 196.03) and MYR 790 (USD 184.36), respectively (Jabatan Penerangan Malaysia, 2013). This may help participants to afford a healthy food in order to prevent recurrence of urinary tract stone. Further results from this study also revealed that majority participants did not agreed that cost of recommended diet to prevent urinary tract stone is expensive and claimed that they are affordable to buy the recommended diet (table I1). The other possible explanation that contributes this moderate dietary behavior level was Malaysia existence of Price Controlled Goods Act in Malaysia. This act control price of certain food such as animal protein and vegetables especially during festival season (Ministry of Domestic Trade and Consumer Affairs Malaysia, 2015) which ensure cost of foods is affordable for Malaysian with moderate and lower income. Nevertheless, a study by Patel and Mehta (2014) found that low economic status among 76% of the samples caused majority of them had financial problem to adopt with dietary modification.

However, a moderate level of dietary behavior among participants in this study might also influenced by negative reason such as lack of knowledge regarding proper regime of recommended dietary behavior to prevent urinary tract stone recurrence. Analysis of dietary behavior items in this study (table G2) revealed that participants scored low mean score for certain aspect dietary behaviors included: less intake of dairy milk product (Mean = 1.67, SD = .919), less consumption of milk (Mean = 2.32, SD =

1.378) and frequent intake of white meat (Mean = 2.28, SD = 1.061). In this study, higher mean indicated high level of dietary behavior while lower mean indicated low level of dietary behavior practiced by participants. Even though majority of the participants claimed they received information regarding prevention of urinary tract stone, but most of them did not receive information regarding type of their stone after it was removed from their urinary tract system (table 4-1). Basically, knowledge regarding type of urinary tract stone is important as its formation was influenced by patients' dietary intake (Dennison et al., 2011).

Majority of the participants in this study had very lower intake of food rich in calcium. Results revealed that majority of participants (54.5%) never ate dairy product that rich in calcium such as cheese and yogurt while only 12.5% and 6.8% of the participants consumed at least 1 glass of milk in daily basis to 4 -5 days per week (table G1). This finding was similar to other studies on dietary behavior among patients with urinary tract stone where calcium intake consumed by the patients did not achieve recommended amount (Hassapidou, Paraskevopoulus, Karakoltsidis, Petridis, & Fotiadou, 1999; Salmeh et al., 2012). Current guideline suggests patients to maintain calcium between 1,000-1,200 mg (Pearle et al., 2014; Skolarikos et al., 2015) with approximately 3-4 servings per day of dairy product with low calcium (Heilberg & Goldfarb, 2013) or equivalent of four 8-oz glasses of milk (approximately 230 ml) (Gul & Monga, 2014). Intake of calcium lower or higher than recommended amount has been proven to have association with formation of urinary tract stone in previous studies (Curhan et al., 1997; Pizzato & Barros, 2003). Lower intake of calcium in this study may possibility due to lack of proper education from health care professional which was concurrent with the previous study where patients tend to reduce the intake of calcium due to low of knowledge (Salmeh et al., 2012). Moreover, consumption of milk is one of the low foods consumed by Malaysians and the amount consumed was also below than recommendation (Norimah et al., 2008). Also, many participants in this study claimed they did not favor dairy product especially milk when they have been asked during this study which contribute to this unhealthy dietary behavior.

Finding also showed that majority participants had reduced intake of red meat to monthly but most of them consumed frequent of white meat per week (table G1). Food

preference might be the main possible reason contributed to this frequent intake of white meat in this study. Malaysians are preferring white meat in their daily diet as source of protein intake and chicken meat is one of the most consumed foods amongst the urban and rural residents in Malaysia (Norimah et al., 2008). Intake of more white meat per week by majority of the participants in this study was similar with the previous study (Hassapidou et al., 1999). Red meat is animal protein that contains high of purine sources while white meat is contain moderate high purine sources which highly associated with formation of urinary tract stone (Ngo & Assimos, 2007; Pearle et al., 2014). Thus, frequent intake of white meat may still put participants at risk of urinary tract stone recurrence. Besides, race might also influence participants' meat preference where Malays were dominating the chicken lover category in Malaysia (Jayaraman, Munira, Dababrata Chowdhury, & Iranmanesh, 2013). This might explained frequent intake of white meat in this study as majority of the participants in this study are Malay (table 4-1).

Protein from plant sources (beans and legumes) can be substituted as a dietary alternative to prevent urinary tract stone without negative consequences (Saxena & Sharma, 2010). Protein from plant sources help to increase alkali renal load and decrease uric acid excretion in the urine to prevent formation of urinary tract stone (Pearle et al., 2014; Remer & Manz, 1995). However, majority of the participants (43.2%) consumed protein from plant sources (legumes) monthly compared to only 4.5% participants who consumed it in daily basis. Instead of eating legumes, Majority of the participants in this study claimed they preferred to eat vegetables.

Thus, the moderate level of dietary behavior might be contributed by reasons which associated with patients' demographic data. Besides, the moderate level of dietary behavior in this study was congruent with the description of their dietary behavior where good practice was observed in certain dietary aspect while there are unhealthy dietary behaviors were observed in another aspect of diet.

Level of Perceived Benefits to Dietary Behavior among Persons Undergone Urinary Tract Stone Removal

Findings from this study showed that majority participants in this study perceived benefits of recommended dietary behavior to prevent urinary tract stone recurrence in a moderate level (Table 4-3).

There were several reasons that might contribute to moderate level of perceived benefits among these participants in this study. Data demographic data revealed that most of the participants in this study aged between 41-50 years old and 51-60 years old with majority of them were employed (table 4-1). According to the results, most of the participants still in productive age to work as the minimum retirement age for government and private worker in Malaysia is 60 years old (Ministry of Human Resources Malaysia, 2013). The need to stay healthy is important in order to ensure they can continue to work. This may explain results that showed the most benefit perceived by the participants in this study is to help them to stay healthy (96.6%) (Table H2).

Monthly income might also contribute to moderate level of perceived benefits to recommended dietary behavior in this study. Findings showed that majority of the participants had moderate monthly income which between MYR 1500-3500 (USD 356.08 - 830.86) (table 4-1). In addition, majority of the participants had history of stone removal 2-3 times (table 4-1). An individual cost of procedure to treat urinary tract stone such as ESWL and URS in Malaysia are approximately MYR 128.50 (USD 35.28) and MYR 289.53 (USD 79.53) without included the cost for medication (Izamin et al., 2009). This cost considered high compared to participants' monthly income if patients have to experience the repeated removal stone procedure in the future. Thus, this reason may explain the participants' had high perceived benefit of practiced recommended dietary behavior towards saving cost related to the disease concerning cost of repeated surgery, medication and hospital expenditure (96.6%) (table H2).

Other possible reason of moderate level of perceived benefits is history of illness. Findings revealed that half of the participants having history of illness such as diabetes, hypertension, heart disease and gout (table 4-1). History of illness such as hypertension

might influence in certain good dietary behavior of the participants such as less salt intake in their daily diet regime (table G1). This situation may lead to beliefs that the high benefits of recommended dietary behavior are helping them to feel better (95.5%) and increase control over their own health (94.3%) (table H2). This finding was concurrent with a study of patients with risk of heart disease where patients strongly perceived that benefits by eating healthy diet can help them to feel much better and increase control over their own health (Baldwin, 2014). Moreover, findings also revealed that majority of the participants (87.5%) believed that benefits of recommended dietary behavior can help to prevent from disease complication such as hypertension, gout, kidney disease and heart disease (table H2).

BMI might also influence participants' perceived benefits into moderate level. However, the benefit item related to help to maintain or reduce body weight (79.5%) (table H2) had lower total scores in total agreement among participants in this study. The possible explanation may relate to variation among samples' BMI. Half of the participants in this study were having normal BMI while another half participants were having BMI either in overweight or obese category (table 4-1). Obese participants perceived benefits on maintain or reduction weight (Mean = 2.71, SD = .726) less than overweight participants (Mean = 3.03, SD = .669) and participants with normal BMI (Mean = 3.13, SD = .607) (table H3). This finding was opposite from population with diabetes where reduce body weight was ranked among the highest benefits perceived by the respondents (Pawlak & Colby, 2009; Sharifirad, Entezari, Kamran, & Azadbakht, 2009). Other lowest benefit of recommended dietary behavior perceived by the participants in this study is to prevent from long term intake of medication. This lower perception may due to situation where participants who had removed the stone still have to take certain medication for long term in order to prevent the disease complication.

Hence, even in general participants had high beliefs towards all benefits of recommended dietary behavior items but there are several reasons that lead to total moderate level among this population. Further study should to be done in order to predict strong factor that influence perceived benefits among this population.

Level of Perceived Barriers to Dietary Behavior among Patients Undergone Urinary Tract Stone Removal

Findings showed that majority of the persons undergone urinary tract stone removal in this study perceived barriers to dietary behavior in a moderate level (table 4-4).

The lowest barriers to dietary behavior perceived by the participants in this study are related to family and friend support. Findings from this study revealed only 26.2 % participants claimed lack of family or friends support and 10.2% participants agreed or strongly agreed that family members or friends influence them to eat unhealthy diet (table I2). In this study, most of the participants were married which mean they practically living with their family. Their family may help to remind and control participants' dietary behavior continuously. High support from family and friend may help participant to reduce barriers in performing dietary behavior as recommended. Spouse's influence on the behavior patients may also encouraging them to adopt a better dietary behavior (Wood et al., 2009).

Another low barrier reported in this study is related to cost to buy recommended diet. There are only 27.3% of the participants claimed they do not enough money to buy recommended diet in order to prevent the disease recurrence (table I2). Further results also revealed that majority participants did not agreed that cost of recommended diet to prevent urinary tract stone is expensive and they are actually affordable to buy the recommended diet (table I1). Participants' economic status may be the possible reason that contributes to lower the barrier related to cost to buy recommended diet in this study. In this study, majority participants were employed and having moderate monthly income (table 4-1). Being employed and having moderate monthly income will help participants to spend extra money on recommended in their effort to prevent the disease recurrence. Furthermore, the price of foods in Malaysia may not so expensive and affordable for peoples with lower and moderate income due to enforcement of act to control price of certain food such as animal protein and vegetables especially during festival season (Ministry of Domestic Health Co-operatives and Consumerism Malaysia, 2015). However, the present findings was opposite from findings from previous studies in the other population with same disease (Patel & Mehta, 2014;

Morowati Sharifabad et al., 2015), where cost of diet was perceived as main barriers to perform good dietary behavior in prevention of urinary tract stone recurrence. A study by Patel and Mehta (2014) found that low economic status among 76% samples causes majority of them had financial problem to adopt with dietary modification.

However, the main barrier perceived by the participants in this study was drinking more fluids intake increased frequency of their daily urinating (table I2). This finding was congruent with previous study among former stone patient (McCauley et al., 2012). In study by McCauley et al (2012) the need to urinate frequently becomes main barrier among former stone patients who successfully practiced at fluids intake in prevention of recurrent urinary tract stone disease. However, in other study on patients with recurrent urinary tract stone, the need to urinate frequently was perceived among the lowest barriers to perform their preventive behavior (Morowati Sharifabad et al., 2015).

Limited choice when eating outside becomes among the main factor perceived as barrier to engage in recommended dietary behavior by the participants in the present study (80.7%) (table I2). This situation may influence by Malaysian's eating attitude who like to eat outside on daily basis (Wan Hafiz, 2005). Besides, majority of the participants were employed (table 4-1) which increase the opportunity for them to eat outside due to their work nature and schedule.

Meanwhile, other main barriers such as low motivation to follow the recommended dietary regime (69.3%) (table I2) and forget about recommended diet regime (61.3%) (table I2) were consistent with previous studies (McCauley et al., 2012; Patel & Mehta, 2014). In previous studies (McCauley et al., 2012; Patel & Mehta, 2014), barrier such as forget about the recommended dietary regime become the main barrier among first time stone former and patients who had low motivation. Lack of strategy in providing health education among health care professionals during followed up may contribute to this low motivation and forgetfulness situation among participants. Findings showed that majority participants received dietary information to prevent urinary tract stone from health care professionals (table 4-1). However, most of the health education was given verbally without using any media to improve participants' understanding. This finding also revealed that only 5.7% of the participants received information from health campaign. Thus, lack of health campaign related to prevention

of urinary tract stone disease in Malaysia might also influence participants' long term motivation and memory.

Thus, the moderate level of perceived barriers might influenced by several factors which lead to high barriers and low barrier perceived by the participants. Further study need to be done to in order to gain more information regarding important barriers that influenced dietary behavior among persons undergone urinary tract stone.

Relationship between Dietary Behavior, Perceived Benefits and Barriers among Person Undergone Urinary Tract Stone Removal

This study aimed to explore the relationship between dietary behavior, perceived benefits and barriers among persons who have undergone urinary tract stone removal in Malaysia. Findings showed there was an inverse significant relationship between dietary behavior and perceived barriers ($r = -.271, p < .05$) which was concurrent with a study conducted on patients with recurrent kidney stone ($r = -.31, p = .000$) (Morowati Sharifabad, et al., 2015). This finding was also congruent with an assumption of the HBM (Rosenstock, 1974; Strecher & Rosentstock, 1997) which suggest that an existence of barriers can negatively influence patients' particular preventive behavior. This result reflected the higher perceived barrier, the less good dietary behavior performed by persons undergone urinary tract stone removal in order to prevent the disease recurrence.

However, this study demonstrated weak correlation between dietary behavior and perceived barriers among this population. The possible reason may relate to lack of effectiveness of instrument items to capture actual barriers experienced by participants in this study. This reason might explain by the certain barrier factor in this study such as drink more water increase frequency of urinating. Even though majority participants perceived this factor as main barrier but majority of them performed a good fluid intake behavior. Other possible reason is an insufficient sample size limiting power to detect significant different which lead to weak correlation between these two variables.

Conversely, although participants in this study were found to have a moderate level of perceived benefits and dietary behavior, there is no significant relationship

demonstrated between dietary behavior and perceived benefits ($r = .099, p > .05$). A perceived benefit was not good predictor of dietary behavior changes among patients who have undergone urinary tract stone disease in this study. This result suggested that no matter how positive their belief towards benefits of recommended dietary behavior, their dietary behavior in prevention of urinary tract stone recurrence is not affected. This finding was incongruent with the assumptions of the HBM (Strecher & Rosentstock, 1997) and findings from other population such as renal failure and diabetes (Agondi et al., 2011; Sharifirad et al., 2009), where perceived benefits was a able to predict patients' health behavior changes. This may due to insufficient sample size limiting power to detect significant different and limited items that address specific benefits in the perceived benefits questionnaire.

Thus, this finding showed that perceived barriers can be an important predictor in dietary behavior changes among persons with urinary tract stone to prevent recurrence of the disease. Further study need to be done as finding from present study shows only weak negative correlation between perceived barriers and dietary behavior which slightly contrast with another previous studies that suggested perceived barriers among the strong predictor to preventive dietary changes. Furthermore, perceived benefits result showed opposite findings with the assumption of the HBM.

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