



พฤติกรรมกรรมการบริโภคอาหาร การรับรู้ประโยชน์
และอุปสรรคในผู้ที่ผ่านการเอาเนื้อออกจากทางเดินปัสสาวะ:

Dietary Behavior, Perceived Benefits and Barriers
among Persons Undergone Urinary Tract Stone Removal

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บทคัดย่อ

อาหารมีส่วนสำคัญในการทำให้เกิดนิ่วในทางเดินปัสสาวะ และการมีพฤติกรรมกรรมการบริโภคอาหารที่ไม่เหมาะสมของผู้ที่เอาน้ำออกจากทางเดินปัสสาวะจะมีความเสี่ยงต่อการเกิดเป็นนิ่วซ้ำได้สูง การวิจัยเชิงพรรณนาหาความสัมพันธ์ครั้งนี้มีวัตถุประสงค์เพื่อศึกษาาระดับพฤติกรรมกรรมการบริโภคอาหาร การรับรู้ประโยชน์และอุปสรรคของผู้ที่เอาน้ำออกจากทางเดินปัสสาวะ และเพื่อศึกษาความสัมพันธ์ระหว่างพฤติกรรมกรรมการบริโภคอาหารกับการรับรู้ประโยชน์และอุปสรรคในผู้ที่เอาน้ำออกจากทางเดินปัสสาวะ กลุ่มตัวอย่างจำนวน 88 ราย ครั้งนี้คัดเลือกจากหน่วยยูโรวิทยา ของโรงพยาบาลตังคูอัมปวน โรงพยาบาลกัวลาลัมเปอร์ และโรงพยาบาลซีลายัง ในมาเลเซีย ดำเนินการเก็บข้อมูลระหว่างเดือนระหว่างเดือนมิถุนายน ถึงเดือนกันยายน พ.ศ.2558 เครื่องมือที่ใช้ในการวิจัย ได้แก่ แบบสอบถามข้อมูลทั่วไป แบบสอบถามพฤติกรรมกรรมการบริโภคอาหาร แบบสอบถามการรับรู้ประโยชน์และ แบบสอบถามการรับรู้อุปสรรค วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา และ สัมประสิทธิ์สหสัมพันธ์แบบเพียร์สัน และแบบสเปียร์แมน

ผลการศึกษาพบว่า

1. คะแนนพฤติกรรมกรรมการบริโภคอาหารของผู้ที่เอาน้ำออกจากทางเดินปัสสาวะอยู่ในระดับปานกลาง ($\bar{x} = 61.84$, $SD = 5.567$)
2. คะแนนการรับรู้ประโยชน์ของผู้ที่เอาน้ำออกจากทางเดินปัสสาวะอยู่ในระดับปานกลาง ($\bar{x} = 30.28$, $SD = 3.815$)
3. คะแนนการรับรู้อุปสรรค ของผู้ที่เอาน้ำออกจากทางเดินปัสสาวะอยู่ในระดับปานกลาง ($\bar{x} = 34.60$, $SD = 3.976$)

การรับรู้อุปสรรคมีความสัมพันธ์ทางลบอย่างมีนัยสำคัญทางสถิติกับพฤติกรรมกรรมการบริโภคอาหาร ($r = -0.271$, $p < 0.05$) และการรับรู้ประโยชน์มีความสัมพันธ์ทางบวกอย่างไม่มีนัยสำคัญทางสถิติกับพฤติกรรมกรรมการบริโภคอาหาร ($r = 0.099$, $p > 0.05$)

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ผลการศึกษาวิจัยครั้งนี้จะเป็นข้อมูลพื้นฐานสำหรับบุคลากรด้านสุขภาพเพื่อให้เกิดความรู้ความเข้าใจเกี่ยวกับพฤติกรรมกรรมการบริโภคอาหารการรับรู้ประโยชน์ การรับรู้อุปสรรค และเป็นแนวทางในการศึกษาวิจัยเพื่อวางแผนการปฏิบัติการป้องกันการเกิดเป็นนิ่วซ้ำในกลุ่มผู้ที่เอานิวออกจากทางเดินปัสสาวะต่อไป

คำสำคัญ: พฤติกรรมการบริโภคอาหาร ทางเดินปัสสาวะ

Abstract

Diet plays an important role in the formation of urinary tract stones and unhealthy dietary behavior among persons undergone urinary tract stone removal, and may expose patients to a higher risk of disease recurrence. This descriptive correlational study aimed to explore dietary behavior and its perceived benefits and barriers among persons who have undergone urinary tract stone removal and to explore the relationship between these variables. Eighty eight subjects were recruited from the Urology Department of Tengku Ampuan Afzan Hospital, Kuala Lumpur Hospital and Selangor Hospital in Malaysia. Data collection was carried out from July to September, 2015. The research instruments composed of a Personal Profile Data, a Dietary Behavior Questionnaire (DBQ), a Perceived Benefits Questionnaire and a Perceived Barriers Questionnaire. Descriptive statistics, Pearson correlation and Spearman's rank order correlation test were used to analyze the data.

The results of this study revealed that:

1. The score of dietary behavior among persons undergone urinary tract stone removal was at a moderate level ($=61.84$, $SD=5.567$)
2. The score of perceived benefits of dietary behavior among persons undergone urinary tract stone removal was at a moderate level ($= 30.28$, $SD = 3.815$).
3. The score of perceived barriers of dietary behavior among persons undergone urinary tract stone removal was at a moderate level ($= 34.60$, $SD = 3.976$).
4. There was an inverse significant relationship between perceived barriers and dietary behavior ($r = -.271$, $p < .05$), and a non-significant relationship between perceived benefits and dietary behavior ($r = .099$, $p > .05$).

The findings of this study provides baseline information for health care professional in order to have a better understanding regarding dietary behavior and its perceived benefits and barriers among persons undergone urinary tract stone removal. The results can be used to develop further programs to promote appropriate dietary behavior among persons undergone urinary tract stone removal to prevent urinary tract stone recurrence.

Key words: Dietary behavior ,Urinary tract



Background and Significance

Urinary tract stone disease is the third most common clinical disorder in urinary tract system (Papadoukakis, Stolzenburg & Truss, 2006). Generally, surgical treatment became the most favorable option in urinary tract stone removal among urologists. 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. 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). 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, Willet, Knight & Stampfer, 2004). Diet to prevent urinary stone and its recurrence episode included 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). According to Health Belief Model, a person is likely to change their behavior if they believe the benefits outweigh the barriers (Rosenstock, 1974; Strecher & Rosenstock, 1997). Perceived benefit is defined as a person's belief

about the value or usefulness of a new behavior to reduce a threat or illness, while 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). 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.

Objectives

The objectives of this study were to examine dietary behavior, perceived benefits and perceived barriers among persons undergone urinary tract stone removal and to examine the relationship between these three variables.

Conceptual Framework

The conceptual framework study of dietary behavior, perceived benefits and barriers among persons undergone urinary tract stone removal was based on the Health Belief Model (HBM). The HBM recommended that health behavior is influenced by a person's beliefs about the disease (Rosenstock, 1974; Strecher & Rosenstock, 1997). These beliefs include perceived benefit of and perceived barrier to perform the



health behavior (Rosenstock, 1974; Strecher & Rosenstock, 1997). The recurrence of urinary tract stone is associated with the dietary behavior of patients. After urinary tract stone removal, a person is likely to perform or engage in dietary preventive behavior if they perceived the benefits to be more than the barriers and would help them to prevent urinary tract stone recurrence.

Methodology

Population and sampling

This descriptive correlational study was carried out among persons undergone urinary tract stone removal from Urology Department of Kuala Lumpur Hospital, Hospital Tengku Ampuan Afzan and Selayang Hospital. A sample size was determined using power analysis with $\alpha = .05$, a power of .80 and medium size effect of .30 (Polit & Hungler, 2004). A total 88 participants were recruited by using proportional method from each hospital. Study criteria included participants who aged 18 to 64 years old, undergoing any procedure of stone removal, participate voluntarily, able to read, write and understand Malay language.

Research Instruments

The self-administered questionnaire in this study composed of four parts developed by the researcher based on existed instruments and literature review. Part I is a personal profile data consisted of 13 items. Part II comprised of 18 items assessed participants' dietary behavior with 5 point Likert Scale; Daily, 4-5 days per week, 2-3 days per week, Monthly and Never. These behaviors included intake of calcium, oxalate, salty foods, protein, fruits, vegetable

and fluid. Total possible score ranged from 18-90. Part III consisted of 10 items of perceived benefits with total possible score ranged from 10-40. Part IV consisted of 14 items related to perceived barriers with total possible score ranged from 14-56. Part III and IV were developed into 4 rating scale: Strongly Disagree (1), Disagree (2), Agree (3), Strongly Agree (4). Dietary behaviour, perceived benefits and perceived barriers were categorized into three levels: low, moderate and high. The questionnaire was validated by six experts from Faculty of Nursing (FON), Chiang Mai University (CMU) and Malaysia. The reliability of the questionnaire was tested on 15 persons who had same characteristics with the study participants. The Cronbach's alpha for Dietary Behavior Questionnaire (.71), Perceived Benefits Questionnaire (.91) and Perceived Barriers Questionnaire (.73) were acceptable for new instrument (DeVellis, 2003). Test-retest reliability of Dietary Behavior Questionnaire after 1 week, $r = .72$ showed a good temporal stability of the questionnaire.

Ethical Consideration

This study was approved by the Research Ethics Committee of FON, CMU and Medical Research and Ethic Committee Malaysia. Permission to collect data was obtained from hospital directors and head departments of Urology from each hospital. Prior to the data collection, written consent was obtained from the participants willingly. Anonymity and confidentiality of the participants were maintained during this study.

Data Collection

Participants who met the inclusion criteria



were identified by reviewing medical records and were approached for permission. Each participant would sign the written consent and completed the questionnaire in specific room.

Data Analysis

Data was analyzed using Statistical Package for Social Science as follows: 1) Descriptive statistic was used to analyze personal profile, dietary behavior, perceived benefits and perceived barriers data. 2) Pearson and Spearman's rank order correlation test were used to analyze the relationship these three variables. At level significance of .05, the direction and magnitude of correlation was determined as weak, $r = 0 - < .30$; moderate, $r = .30 - .50$ and strong, $r = > .50$ (Grove & Burns, 2012).

Results

Participants' personal profile characteristics

Eighty eight participants, aged range from 18 to 64 years old completed the questionnaire (Mean = 47.51, SD = 9.849). Majority of the participants were male (64.8%) and (35.2%) were female. Participants' average BMI was 25.80 (SD = 4.522) with half of the patients' BMI were in normal category (45.5%). Malays were predominant (85.2%) and most of

the participants were married (93.2%). More than half participants (61.4%) had secondary school level of education. There are 62.5% of them were employed while housewife and unemployed patients were 15.0% and 9.1%, respectively. Most of the employed participants (36.4%) had monthly income between MYR 1500 to MYR 3500 (USD 356.08 - 830.86). A 46.6% of the participants had no history of other illness while majority participants who had history of illness were suffered from hypertension and followed by diabetes mellitus; 23.9% and 11.4%, respectively. 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. Majority participants (67.0%) received information regarding urinary tract stone prevention mainly from health professionals such as doctors and nurses.

Dietary behavior of the participants

Dietary behavior of the participants in this study was in a moderate level (78.4%). Total mean score for dietary behavior was 61.84 (SD=5.567). Table 1 provided details for selected dietary behavior among persons undergone urinary tract stone removal to prevent urinary tract stone recurrence.



Table 1 Number, percentage and item mean for selected dietary behavior (n=88)

Dietary behavior	Daily	4-5 days per week	4-5 days per week	Monthly	Never	Item mean
	n (%)	n (%)	n (%)	n (%)	n (%)	
Add more salt to my meal at the table	2(2.3)	1(1.1)	6(6.8)	7(8.0)	72(81.8)	4.66
Drink at least 6-8 glasses of water	64(72.7)	8(9.1)	14(15.9)	2(2.3)	0 (0)	4.52
Eat no more than 1 serving of red meat	4(4.5)	5(5.7)	29(33.0)	41(46.6)	9(10.2)	3.52
Drink at least 1 glass of milk	11(12.5)	6(6.8)	17(19.3)	20(22.7)	34(38.7)	2.32
Eat no more than 1-2 serving of white meat	31(35.2)	8(9.1)	44(50.0)	3(3.4)	2(2.3)	2.28
Eat dairy product	1(1.1)	5(5.7)	6(6.8)	28(31.8)	48(54.6)	1.67

Level of perceived benefits and barriers

Table 2 Mean, standard deviation, frequency, percentage and level of perceived benefits and barriers (n=88)

	Mean score	SD	n (%)	Level
Perceived benefits	30.28	3.815	48 (54.5)	Moderate
Perceived barriers	34.60	3.976	82 (93.2)	Moderate

Relationship between dietary behavior, perceived benefits and barriers

Table 3 Relationship between dietary behavior, perceived benefits and barriers (n=88)

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

* p< .05



Discussion

Level of Dietary behavior of the participants

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 samples (67.0%) received information regarding diet to prevent urinary tract stone recurrence from unstructured health education program either health care professionals such as nurses and/or doctors or other sources. This information may help patients to practiced good recommended diet behavior such as drinking at least 6 to 8 glasses daily which concurrent with standard recommendation of fluid intake in order to prevent formation of urinary tract stone (Pak, 2004; Skolarikos et al., 2015). In this study, participants claimed water is the easiest method to practice and remember in prevention recurrent stone which always have been emphasized continuously by their health care professional during clinic visits.

Level of education may also contribute to moderate level of dietary behavior among these participants in this study. Almost all the participants in this study received formal education with majority of them (61.4%) received formal education until secondary high school. This may help participants to understand information given by health care professional during health education about 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.

Social support from family members and friends might also become important reason that contributes to this 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 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. Living and eating together during meals time is family culture in Malaysia. Being married and living with family increased patients' knowledge score and substantially improved patients' personal diet practice score in prevention kidney stone disease ($p < .001$) (Bakunt (2011).

Nevertheless, moderate level of dietary behavior among participants in this study might also influenced by reason such as lack of knowledge regarding proper regime of recommended dietary behavior to prevent urinary tract stone recurrence. 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. Basically, knowledge regarding type of urinary tract stone is important as stone 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. 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 et al., 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). Lower intake of calcium in this study may possibility due to lack of proper education from health care professional which concurrent with previous study where patients tend to reduce the intake of calcium due to low of knowledge (Salmeh et al., 2012). 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). Besides, 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. Food preference might be the main possible reason contributed to this frequent intake of white meat in this study. Malaysians are prefer 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). 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.

Level of Perceived Benefits of Dietary Behavior

There were several reasons that might contribute to moderate level of perceived benefits among study's participants. Data demographic data revealed that most of the samples in this study aged between 41 – 50 years old and 51 – 60 years old with majority of them were employed. Most of the patients 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 might explain results that showed the most benefit perceived by the samples in this study is to help them to stay healthy (96.6%).

Monthly income might also contribute to moderate level of perceived benefits in this study, where majority of the participants had moderate monthly income. In addition, majority of the participants had history of stone removal 2 -3 times. 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 participants 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%).

History of illness such as hypertension might influence in certain good dietary behavior of the samples such as less salt intake in their daily diet regime. This situation may lead to beliefs that the high benefits of recommended dietary behavior are helping them to feel better (95.5%) and increased control over their own health (94.3%). These findings were 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.

Level of Perceived Barriers to Dietary Behavior

A moderate level of barriers that perceived by majority of participants in this study might influenced by several reasons. The main barrier perceived by the participants in this study was

drinking more fluids intake increased frequency of their daily urinating. This finding was congruent with previous study among former stone patient (McCauley et al., 2012). 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 80.7% participants in this study. This situation may influence by Malaysian's eating attitude who like to eat outside on daily basis (Wan Hafiz, 2005). Besides, majority of the patients were employed which increase the opportunity for them to eat outside due to their work schedule and nature. Meanwhile, barriers such as low motivation to follow the recommended dietary regime and forget about recommended diet regime were consistent with previous studies (McCauley et al., 2012; Patel & Mehta, 2014). Lack of strategy in providing health education among health care professionals during patients' followed up may contribute to this low motivation and forgetfulness situation. Findings showed that majority participants received dietary information to prevent urinary tract stone from health care professionals. However, most of the health education was given verbally without using any media to improve patients' 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.

However, 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% patients agreed or strongly agreed that family members or friends influence them to eat unhealthy diet. In this study, most of the participants are married which mean they practically living with their family. Spouse's influence on the behavior patients may also encouraging them to adopt a better dietary behavior (Wood et al., 2007). Another low barrier reported in this study was 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. Majority participants did not agree that cost of recommended diet to prevent urinary tract stone is expensive and claimed affordable to buy the recommended diet. Participants' economic status may be the possible reason that contributes to lower the barrier related to cost to buy recommended diet as majority participants in this study were employed and having moderate monthly income. However, the present findings was opposite from findings from previous studies in the other population with same disease (Patel & Mehta, 2014; 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.

**Relationship between dietary behavior,
perceived benefits and barriers**

Findings showed there was an inverse significant relationship between perceived barriers and dietary behavior ($r = -.271, p < .05$) which was concurrent with a study conducted on patients with recurrent kidney stone ($r = -.31, p = .000$) (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. In contrary, although patients in this study were found to have moderate level of perceived benefits and dietary behavior, there is no significant relationship demonstrated between perceived benefits and dietary behavior ($r = .099, p > .05$). 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; Sharifrad et al., 2009), where perceived benefit was a able to predict patients' health behavior changes. Small sample size might limit power to detect significant different between dietary behavior and perceived benefits as well as led to a weak correlation between dietary behavior and perceived barriers.

Conclusions and Recommendations



Findings from this study revealed that majority of the participants had a moderate level of dietary behavior to prevent urinary tract stone, The participants also perceived the benefits and barriers to prevent urinary tract recurrence by practicing recommended dietary behavior in a moderate level. In term of relationship between these three variables, slightly significant negative was observed between dietary behavior and perceived barriers. However, there is no relationship was found between dietary behavior and perceived benefits. These findings would help health care professionals develop an effective strategy of health education to minimize the barriers and strengthen the benefits of dietary behavior in

order to help patient to prevent urinary tract stone recurrence. In regards of the study recommendation, similar study with specific stone type and larger sample should be done in the future in order to gain more specific information.

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