Knowledge, attitude, practice (KAP) and health related quality of life of priests with type 2 diabetes mellitus in Thailand

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ABSTRACT

Buddhist monks' lifestyle being different than general population has made them prone to diabetes mellitus (DM). The objectives of the study were to explore the patient's knowledge, attitude, and practice (KAP) regarding drug use and diabetic complications, factors affecting clinical outcomes and to study the health related quality of life (HRQoL) among type 2 diabetic Buddhist monks in Thailand. This study was an analytical research in which data was collected from face-to-face interview via questionnaire and EQ-5D-5L. A total of 120 outpatient Buddhist monks identified as type 2 diabetes were selected using the convenient sampling method. Data collection period was from May to June 2015. The result revealed that knowledge on drug use was positively correlated with attitude and likewise attitude with practice. Modern education level and chronic heart disease was statistically significant with clinical outcome. Chronic heart condition was negatively correlated with HRQoL. The major finding suggests that healthcare providers of the hospitals should focus more towards the provision of health education to monks regarding diabetic complications, most specifically chronic heart conditions. The results from this study can be used to improve the services and education provided to patients and monks with DM.

1. INTRODUCTION

In recent years, diabetes has been a common metabolic disease with major public health concern with heavy economic burden as well[1]. The increase in prevalence of diabetes has led to an increase in prevalence of diabetic complications like retinopathy, stroke, hypertension, coronary diseases etc. that has ultimately affected healthcare costs as well as patients' outcomes[2]. The prevalence of diabetes among Thai population has increased from 2.3% in 1991 to 6.9% in 2004 according to 2003-2004 health examination survey. There has also been a rising trend in the hospitalization rate among Thai diabetic patients due to acute or long-term diabetic complications[3]. According to WHO, 71% of all deaths in Thailand are because of non-communicable diseases, with cardiovascular diseases representing 21% and diabetes 6%[4].

In Thailand, about 93.6% of the population is Buddhists and about 291,116 Buddhist monks scattered throughout the country with about 37,075 Buddhist temples[5]. Monks have a very specific way of living maintaining strict discipline being devoted to spiritual development. In central Bangkok, about 35% of Buddhist monks have health risks and problems. Particularly because of their

specific lifestyle behaviors different than general population, they tend to have poor health status. The mission of the Priest Hospital in Bangkok is to maintain the overall health status of the monks, and keeping in mind the health condition and barriers, the hospital is aware towards implementation of future health promotion campaigns[6]. A report in 2007 from the Priest Hospital showed that among 17,381 Buddhist monks who came for treatment at the hospital, 17.8% had been diagnosed with DM, 17.1% hypertension and 13.5% hyperlipidemia[7] and the statistics of the Priest Hospital from 2009 to 2012, shows that heart disease and DM are in a continuous increasing trend every year particularly due to their lifestyle different than normal people. Buddhist monks' lack of attention towards health promotion practice and epidemiology of common diseases has been some of the determinants in the failure of disease prevention among priests[8].

With the increasing incidence of chronic illnesses among monks, it becomes important for researchers to explore their health status to come up with healthcare intervention strategies in hospital levels to improve monks' living status. Therefore, the aims of this study were to explore patient's knowledge, attitude, and practice (KAP) regarding drug use and diabetic complications, factors affecting clinical outcomes based on blood glucose level and also to study the health related quality of life (HRQoL) as nonclinical outcomes among type 2 diabetic Buddhist monks in Thailand.

2. MATERIALS AND METHODS

2.1. Study design

This study was an analytical research with face-to-face interview analysis conducted via questionnaire and EQ-5D-5L instrument http://www.euroqol.org/eq-5d-products/eq-5d-5l.html.

2.2. Study sample

The patients included in the study must have visited the Priest Hospital for treatment regularly or have been following up at least once every 2-3 months. All the outpatient Buddhist monks identified as type 2 diabetes according to their primary diagnosis identified using The International Code of Disease, 10th revision as the code: E-11.0 to E11.9 were eligible for the study.

2.3. Data collection

Data was collected from the period of May 2015, via face-to-face interview till 2 months. Patients with severe cognitive problems and those who did not comply with patient consent were excluded from the study. Sample size calculation was done to calculate the number of priests to interview via convenience sampling method. As per the 2013 hospital database, about 1,400 outpatient diabetic monks were registered at the hospital, which means approximately an average of 116 monks visited in a month. Since the diabetic clinic only opens 8 days in a month that would mean it's ideal to interview 15 patients in a day i.e. 240 monks in two months study timeframe. However, it seemed impossible to interview 15 patients per day due to the insufficient time conducted for interview since the questionnaire was very detailed and the patients did not seem to comply well with the interview process as it required a longer time. So as per many discussions, we came up with the solution to interview 120 monks in total 2 months period with 7 or 8 patients in a day.

2.4. Study instrument

Data was collected via self-made questionnaires to analyze knowledge, attitude and practice (KAP) towards drug use and complications and factors affecting HRQoL via EQ-5D-5L form. EQ-5D-5L tool was used to measure HRQoL, which has been identified to be used in Thai context according to Thai Health Technology Assessment (HTA) guidelines[9]. The questionnaire consisted of demographic information of patient, clinical status of patient, health service utilization information since last follow up, knowledge, attitude, practice regarding complications of diabetes and drug use or adherence.

For the KAP of complications, it consisted of three sections i.e. to measure 'knowledge', 'attitude' and 'practice' regarding diabetic complications. They all had a total score of 23, 15 and 8 respectively to which the correct answers to each question were coded as 'good' with score of 1 and 'poor' scored as 0. Similarly, for KAP on drug use, it consisted of three sections i.e. to measure 'knowledge',

'attitude' and 'practice' about the use and adherence with their medication. They all had a total score of 17, 6 and 7 respectively to which the correct answers to each question were coded as 'good' with score of 1 and 'poor' scored as 0 except in 'practice' where it was opposite.

For EQ-5D-5L, the index score was obtained from Thai valuation set of EQ-5D-5L using EuroQoL's group valuation technology. The index scores range from 0 to 1 representing worst health and best health respectively. The visual analogue scale (VAS) score was obtained by dividing the number on the scale by 100 resulting in a number between the range of 0 and 1[10].

2.5. Ethical approval

This study was conducted after final permission to perform the study, which was granted by approval from Faculty of Dentistry/ Faculty of Pharmacy Mahidol University Institutional Review Board (MU-DT/PY-IRB).

2.6. Data analysis

After the data were collected from completed questionnaires and EQ-5D-5L, the general characteristics of the patients were analyzed using descriptive statistics. Continuous variables from demographics and clinical features of patients, which are normally distributed, were described by mean and standard deviation. Categorical variables were reported using frequency (n) and percentage (%). To check the correlation between general characteristics (demographic and clinical characteristics) of patients with the outcome i.e. blood glucose level, Pearson correlation test or Spearman's rank correlation test was performed with level of significance $p<0.05$. Similarly, Pearson's correlation coefficient test was used to check the relation between KAP of diabetic complications and KAP of drug use compliancy at $p<0.05$ level of significance. Association between EQ-5D-5L index score and EQ-VAS score was expressed by Spearman's correlation coefficient. One-way ANOVA (Scheffe's test) and independent t-test was done to check the relationship between EQ-5D-5L and EQ-VAS with the patient characteristics to determine the factors that affect the HRQoL in type 2 diabetic monks.

3. RESULTS

Table 1 shows demographic and clinical characteristics of 120 interviewed monks, which showed that majority of the total monks, were of age group 44 to 56 years old (45.8%). In terms of modern education level, 43.3% of them did primary education being the highest whereas very few took vocational level study (4.2%) being the lowest. Similarly, majority of them i.e. 83.3% of interviewed monks took Naktham level of religious education system compared to Parian and Apidhamma.

Table 1. Demographics and clinical characteristics of patients

Characteristics	n (%)
Age group (years)	
• 18 to 30	8 (6.7%)
• 31 to 43	28 (23.3%)
• 44 to 56	55 (45.8%)
• 57 to 69	21 (17.5%)
• 70 to 82	8 (6.7%)
Modern education system	
• Primary	52 (43.3%)
• Secondary	17 (14.2%)
• High school	19 (15.8%)
• Vocational	5 (4.2%)
• Bachelor and above	21 (17.5%)
• Others	6 (5.0%)

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Table 1. Demographics and clinical characteristics of patients (contd.)

Characteristics	n (%)
Religious education system	
• Naktham	100(83.3%)
• Parian	8 (6.7%)
• Apidhamma	0 (0.0%)
• No education	11 (9.2%)
Monk rank	
• Ordinary	102 (85.0%)
• Phrasamu*	4 (3.3%)
• Phrakhru**	13 (10.8%)
• Venerable teacher	0 (0.0%)
• The royal title rank	1 (0.8%)
Monk status	
• Ordinary	92 (76.6%)
• Abbott	9 (7.5%)
• Assistant/associate abbott	8 (6.7%)
• Abbott/chief of sub-district	1 (0.8%)
• Abbott/chief of district	0 (0.0%)
• Abbott/chief of province	0 (0.0%)
• Others	10 (8.3%)
Blood glucose level in mg/dl; mean (SD)	126.03 (80.74)
Blood glucose level group	
• <100mg/dl	21 (17.5%)
• 100-125mg/dl	24 (20.0%)
• ≥126mg/dl	75 (62.5%)
Years of type 2 DM prevalence; (mean, SD)	9 (7.184)
Chronic conditions	
• High blood pressure	56 (46.7%)
• High cholesterol	54 (45.0%)
• Heart disease	18 (15.0%)
• Lung disease	1 (0.8%)
• Others	27 (22.5%)
Comorbidities	
• Eye problem	61 (51.8%)
• Leg/foot infection	12 (10.0%)
• Others	10 (8.35)
• Chest pain	8 (6.7%)
• No problems	44 (26.7%)
Admission due to type 2 DM	38 (31.7%)
Follow-up duration	
• 1-3 months	115 (95.8%)
• 4-6 months	4 (3.35)

Note: *, ** are types of monk ranks

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It was seen that majority of them (62.5%) were found to have fasting blood glucose level of ≥126 mg/dl, which is the diabetes level followed by 20.0% with pre-diabetic level (100-125 mg/dl) and 17.5% had normal level of blood glucose (<100 mg/dl). In terms of chronic conditions that these patients had, it was seen that majority of them i.e. 46.7% had high blood pressure followed by high cholesterol level (45.0%). Similarly, in terms of comorbidities, 51.8% of them experienced eye problems. Majority of the patients (95.8%) had a tendency to follow up in every 1-3 months.

Regarding the health service utilization besides visiting the Priest Hospital, it was seen that the patients did not tend to utilize other health services apart from following up with the Priest Hospital. 12.5% of them reported taking herbal products to cure their disease followed by visiting clinics/hospitals other than the Priest Hospital (8.3%), taking food supplements (6.7%), getting alternative treatments

(2.5%) and taking vitamins (1.7%). Among 8.3% of those who went to other clinics reported paying maximum of 100,000 Baht for the treatment.

A part of the questionnaire was also to measure knowledge, attitude and practice (KAP) regarding drug use and adherence. Table 2 shows that the patients had good knowledge on taking medications as prescribed, being strict to treatment plan, knowledge on complications while self-stopping the medications, consulting doctors when feeling worse and carrying medications while traveling. Similarly in terms of drug use, patients showed good attitude towards the behavior of stopping the medication without consulting the healthcare professionals which they responded would have strong effect on their health as seen in Table 3. Regarding good practice of drug use, patients tended to show good practice in terms of not stopping the medicines and self-analyzing as seen in Table 4.

Table 2. Knowledge about drug use or adherence (n=120)

	Yes (n, %)	No (n, %)
1. Shouldn't forget to take medications as prescribed	**116 (96.7%)**	4 (3.3%)
2. Should stick to your treatment plan	**113 (94.2%)**	7 (5.8%)
3. Self-stopping your medication might create complications	**113 (94.2%)**	7 (5.8%)
4. Should consult your doctor when feeling worse	**109 (90.8%)**	11 (9.2%)
5. Should carry medications while travelling	**116 (96.7%)**	4 (3.3%)
6. Did you know about it from doctor?	**104 (86.7%)**	16 (13.3%)
7. Did you know about it from pharmacist?	**26 (21.7%)**	94 (78.3%)
8. Did you know about it from nurse?	**16 (13.3%)**	104 (86.7%)
9. Did you know about it from friend/family?	**5 (4.2%)**	115 (95.8%)
10. Did you know about it from TV/radio?	**0 (0.0%)**	120 (100%)
11. Did you know about it from newspaper?	**6 (5.0%)**	114 (95.0%)
12. Did you know about it from internet?	**1 (0.8%)**	119 (99.2%)
13. Did you know about it from others?	**7 (5.8%)**	113 (94.2%)
14. Would you like to know this from hospital services?	**86 (71.7%)**	34 (28.3%)
15. Would you like to know this from media?	**10 (8.3%)**	110 (91.7%)
16. Would you like to know this from healthcare provider?	**14 (11.7%)**	106, (88.3%)
17. Would you like to know this from others?	**9 (7.5%)**	111, (92.5%)

(Bold ones are good knowledge.)

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Table 3. Attitude regarding drug use (n=120)

	Frequency, n (%)			
	No effect	Not sure	**Some effect**	**Strong effect**
1. Forgetting to take medicines	20 (60.7%)	5 (4.2%)	**34 (28.3%)**	**60 (50.0%)**
2. Taking medications at wrong time	24 (20.0%)	7 (5.8%)	**38 (31.7%)**	**51 (42.5%)**
3. Skipping dose of medication	17 (14.2%)	9 (7.5%)	**41 (34.2%)**	**53 (44.2%)**
4. Self adjusting dose of medication	11 (9.2%)	12 (10.0%)	**28 (23.3%)**	**69 (57.5%)**
5. Taking additional drug without asking	15 (12.5%)	21 (17.5%)	**30 (25.0%)**	**54 (45.0%)**
6. Stopping medications without consulting	5 (4.2%)	13 (10.8%)	**20 (16.7%)**	**82 (68.3%)**

(Bold ones are good attitude.)

Table 4. Practice regarding drug use (n=120)

	Yes (n, %)	No (n, %)
1. Forgetting to take medicines	81 (67.5%)	**39 (32.5%)**
2. In the last 2 weeks, forgot to take medications?	39 (32.5%)	**81 (67.5%)**
3. Practice of stopping to take medicines	20 (16.7%)	**100 (83.3%)**
4. Practice of forgetting to take medicines while travelling	51 (42.5%)	**69 (57.5%)**
5. Practice of self-analyzing and stopping drug use	24 (20.0%)	**96 (80.0%)**
6. Feeling bored to stick with treatment plan	38 (31.7%)	**82 (68.3%)**
7. Feeling bored to stick with treatment plan	29 (24.2%)	**91 (75.8%)**

(Bold ones are good practice.)

As seen in Table 5, when we compared the scores from KAP of diabetic complications, it was seen that knowledge (K) regarding diabetic complications was significantly correlated with attitude (A) ($p<0.05$) by using Pearson's correlation test. Similarly in terms of KAP regarding drug use and adherence, it was seen that knowledge (KNOW) was positively correlated with attitude (ATT) and also, attitude (ATT) was significantly correlated with practice (PRAC) with $p<0.05$. So regarding drug use and adherence, knowledge was somehow associated with practice.

Table 5. Correlation between KAP of diabetic complications and KAP of drug compliancy

For KAP of diabetic complications		
Variables tested	Pearson's correlation coefficient (r)	*p*-value
Knowledge (K) with Attitude (A)	0.269	0.003*
Knowledge (K) with Practice (P)	0.123	0.182
Attitude (A) with Practice (P)	0.036	0.693
For KAP of drug use and compliancy		
Variables tested	Pearson's correlation coefficient (r)	*p*-value
Knowledge (KNOW) with Attitude (ATT)	0.282	0.002*
Knowledge (KNOW) with Practice (PRAC)	0.134	0.145
Attitude (ATT) with Practice (PRAC)	0.220	0.016*

*$p<0.05$ (level of significance)

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Furthermore, it was seen from Table 6 that education level, most specifically modern education level was significantly correlated with the patients clinical outcome i.e. blood glucose level. The correlation coefficient was negative which means that the higher the modern education level, the lesser would be the blood glucose level. Similarly, in terms of complications, chronic heart disease seemed to be significantly correlated with blood glucose level. It was positively correlated which would mean that with the increase in chronicity of heart disease, the blood glucose level might seem to increase as well. The correlation was checked at the level of significance using Spearman's rank correlation ($p<0.05$) and Pearson's correlation coefficient test ($p<0.01$).

Table 6. Correlation of general characteristics of patients with blood glucose level

Variables	Pearson correlation coefficient (r)	*p*-value
Age	-0.024	0.795
Years of type 2 DM prevalence	0.113	0.226
Follow up duration (month)	0.026	0.779
Variables	**Spearman's rho (ρ)**	**_p_-value**
Modern education level	-0.210	0.021*
Religious education level	-0.083	0.366
Monk rank	-0.038	0.683
Monk status	-0.083	0.368
Complications		
Chronic heart condition	0.225	0.013*
Chronic lung condition	0.091	0.321
Chronic cholesterol condition	0.022	0.809
Chronic blood pressure condition	-0.030	0.748
Comorbidities		
Past eye problem	0.021	0.816
Past chest pain	0.141	0.125
Past leg/foot infection	-0.057	0.537
Admission due to type 2 DM	0.052	0.573

Table 7 shows that 96.7% of the monks stated they had no problem with self-care followed by having no problem with performing usual activities (82.5%). 30.8% of them experienced slight problem in terms of pain/discomfort followed by anxiety/depression (20.8%). The mean score of EQ-5D-5L was seen to be comparatively better than that of EQ-VAS with 0.89 and 0.71 respectively which means that 89.5% good health was perceived by the patients through EQ-5D-5L. The positive correlation was found between EQ-5D-5L index score and VAS score with correlation coefficient 0.275 ($p<0.002$).

As seen from Table 8, EQ-5D-5L scores were significantly associated with chronic heart condition ($p<0.05$) and chronic lung condition ($p<0.05$). There was no statistically significant relationship between EQ-VAS with any of the patient characteristics. It was also seen that chronic heart condition was negatively correlated (r = -0.234) with the EQ-5D-5L index.

Table 7. Correlation of general characteristics of patients with blood glucose level

EQ-5D-5L domain	Level; n (%)				
	No problem	Slight problem	Moderate problem	Severe problem	Extreme problem
Mobility	77 (64.2%)	16 (13.3%)	18 (15.0%)	8 (6.7%)	1 (0.8%)
Self-care	116 (96.7%)	1 (0.8%)	2 (1.7%)	0 (0.0%)	1 (0.8%)
Usual activities	99 (82.5%)	15 (12.5%)	3 (2.5%)	0 (0.0%)	3 (2.5%)
Pain/discomfort	59 (49.2%)	37 (30.8%)	21 (17.5%)	2 (1.7%)	1 (0.8%)
Anxiety/depression	87 (72.5%)	25 (20.8%)	6 (5.0%)	2 (1.7%)	0 (0.0%)
	Mean	SD	Median		
EQ-5D-5L index	0.895	0.14	0.95		
EQ-VAS	0.714	0.15	0.70		

Table 8. EQ-5D-5L dimensions and EQ-VAS with patient characteristics

	EQ-5D-5L score			EQ-VAS score		
	Mean	SD	*p*-value	Mean	SD	*p*-value
Age group						
Non-elderly (18-49)	0.90	0.11	0.652	0.73	0.15	0.151
Elderly (50 and above)	0.88	0.17		0.69	0.14	
Modern Education level						
Primary	0.89	0.18		0.71	0.17	
Secondary	0.93	0.06		0.71	0.12	
High school	0.86	0.12	0.719	0.66	0.13	0.620
Vocational	0.91	0.14		0.74	0.15	
Bachelor	0.89	0.08		0.74	0.12	
Other	0.82	0.20		0.75	0.08	
Religious Education level						
Naktham	0.89	0.15		0.70	0.15	
Parian	0.90	0.07	0.624	0.74	0.13	0.684
No education	0.85	0.14		0.73	0.14	
Monk rank						
Ordinary	0.89	0.15		0.71	0.15	
Phrasamu	0.97	0.03	0.635	0.78	0.20	0.208
Phrakhu	0.88	0.08		0.65	0.12	
Royal title	1	0		0.90	0	
Monk Status						
Ordinary	0.90	0.12		0.72	0.14	
Abbott	0.80	0.33		0.59	0.16	
Assistant/Associate Abbott	0.92	0.08	0.348	0.72	0.18	0.171
Chief of sub-district	0.90	0		065	0	
Others	0.87	0.12		0.71	0.13	
Chronic heart condition						
No	0.90	0.14	0.033*	0.71	0.15	0.637
Yes	0.98	0.15		0.69	0.13	

Table 8. EQ-5D-5L dimensions and EQ-VAS with patient characteristics (contd.)

	EQ-5D-5L score			EQ-VAS score		
	Mean	**SD**	*p*-value	**Mean**	**SD**	*p*-value
Chronic lung condition						
No	0.89	0.14	0.003*	0.71	0.15	0.450
Yes	0.46	-		0.60	-	
Chronic cholesterol condition						
No	0.91	0.10	0.210	0.72	0.14	0.602
Yes	0.87	0.18		0.70	0.15	
Chronic blood pressure condition						
No	0.89	0.16	0.999	0.72	0.14	0.262
Yes	0.89	0.12		0.69	0.14	
Blood glucose level						
<100 mg/dl	0.88	0.13		0.64	0.14	
100-125 mg/dl	0.90	0.09	0.921	0.71	0.15	0.060
>126 mg/dl	0.89	0.16		0.71	0.14	

4. DISCUSSION

This study focused on the Buddhist monks' health behavior in terms of KAP regarding type 2 DM and also to explore HRQoL as non-clinical outcome. A study conducted among diabetic patients had reported that the most commonly reported complications are hypertension and coronary heart condition resulting in low quality of life[11]. In our study as well, it was seen that majority of them had high blood pressure (47.5%) and high cholesterol problems (45%) in terms of chronic conditions. In terms of health service utilization, most of the interviewed monks in our study seemed to administer herbal products as a remedy as suggested by a study conducted in Thai monks[12] and also preferred to visit clinics other than hospitals.

Our study also showed that modern education level had significant association with clinical outcomes of patients i.e. blood glucose level (*p*<0.05). It was negatively correlated which means that lesser the education level, higher would be the health outcome (blood glucose level). Generally, it is assumed that lower education level has an effect in the health related outcome of exposing patients to health related problems[13, 14]. And in our study, majority of monks went only through primary level of education, which foretells us about the importance of health education to attain health related outcome. It was also seen from this study that chronic heart condition had positive correlation with the blood glucose level that means with the increasing chronicity of heart disease, the blood glucose levels seem to increase as well which is in accordance to some studies[15-17].

In the present study, majority of the monks stated that they had no problem in all of the 5 domains of the HRQoL tool EQ-5D-5L, which is in accordance to another study[18]. This is probably due to the fact that the respondents in our study thought that they were healthy and have no health problems as monks are generally driven by religious and spiritual beliefs and healing system than the rest of the population. Out of all the HRQoL tools, we chose to use EQ-5D-5L in our study among diabetic monks since It is simple to use, provides sufficient responsiveness to changes in health states and relatively wide range of utility scores generated by this tool[9, 19-21]. In our study among diabetic monks, it was seen that the mean score of EQ-5D-5L was seen to be comparatively better than that of EQ-VAS with 0.89 and 0.71, respectively which means that 89.5% good health was reported by EQ-5D-5L, which is in accordance to a study among diabetic patients[10, 22]. Focusing on the EQ-5D-5L index score, it was seen from our

study that chronic heart condition was significantly negatively correlated with health related quality of life. So in terms of improving non-clinical outcomes based on health related quality of life, better strategies needs to be implemented to improve potentially chronic heart condition among patients.

Another crucial assessment in this study was to analyze KAP among monks and the scores suggested a good KAP regarding drug use and adherence which can be justifiable to fact that the monks showed high health related quality of life. This result was similar to a study conducted among Malaysian type 2 diabetic patients in which there was an association between knowledge with attitude, and knowledge with practice[23]. Adherence to drugs to attain good health behavior requires good diabetic health education, which is in accordance to several studies[24-27]. Our study also showed that the monks had very low incidences of chronic heart condition, which could be the reason why the monks perceived that they have a better quality of life. Since it was found that increased chronicity in heart disease was significantly positively associated with increased blood glucose level in patients as well as significantly negatively associated with health related quality of life, it becomes important for the healthcare providers of the hospitals to focus more towards the provision of health awareness education to monks regarding diabetic complications, most specifically chronic heart conditions for better diabetes management among monks in Thailand.

There are some more factors that were not investigated in this study which would have an impact on the outcome of the study, for instance the type of healthcare system and proper strategies needed to be incorporated by the health professionals. Apart from therapeutic treatment, factors such as level of care and time given to the patients by the healthcare professionals would ultimately have an effect in the HRQoL.

There are many limitations to our study. First of all, the sample size of 120 outpatient monks for interview by convenient sampling method could potentially produce number of biases. This might be unlikely to represent the population being studied hence resulting in not being able to make generalizations from the findings of study sample. Another limitation could be that during interview there might have been a difference in the intention and real behavior for example regarding knowledge attitude and practice of drug use and complications. Furthermore, due to the complexity and lengthiness of the questionnaire, there might have been some problems while interviewing monks by the interviewers since there are a lot of missing data especially on the part of KAP and health utilization cost information. And also it was seen that since monks are a special group of people than the general population, there are certain codes to be followed while dealing and communicating with them. So another limitation could be the failure of appropriately delivering the questions, which might lead to misinterpretation of their behavior. In our study we did not focus on patient's satisfaction towards their treatment, which could help identify gaps and challenges in the current hospital services. So future research on this matter could help improve the quality of care for monks for more effective outcomes. Another limitation is that this study did not analyze many other factors that might affect the diabetic control of the patients like patient's compliance to drug and treatment and time duration of the disease. The other limitation would be not being able to incorporate inpatient monks, which could potentially and more clearly help understand their behavior in depth. But apart from some of these limitations, our study is the first study examining the KAP of diabetic drug use and complications as well as health related quality of life among monks at the Priest Hospital in Thailand.

5. CONCLUSIONS

KAP regarding drug use was seen to be better among monks since the study showed that knowledge was being statistically associated with attitude and likewise attitude being associated with practice. This study showed that the monks at the Priest Hospital perceived their health to be good with mean EQ-5D-5L score of 0.85. Similarly, in terms of clinical outcomes, modern

education and chronic heart condition are some factors to affect blood glucose level which emphasizes the need of effective health education among monks to achieve better clinical outcomes. Also, since chronic heart condition was seen to be negatively associated with health related quality of life among monks it becomes important for healthcare providers to maintain and improve the diabetes management of complications, most specifically chronic heart conditions.

Key issues

Majority of the monks interviewed (46.7%) had high blood pressure followed by high cholesterol level (45.0 %) but heart disease and lung disease was seen to have lowest incidence.

In terms of exploring factors affecting the clinical outcomes based on blood glucose level, sociodemographic feature i.e. modern education level was statistically significant with the patients' clinical outcome. The correlation coefficient was negative which means that the higher the modern education level; the lesser would be the blood glucose level**.** The study showed that the monks' health related quality of life was quite good, which would suggest that the hospital administrators could advocate in the monks' policies to promote healthcare intervention strategies in the monasteries.

6. ACKNOWLEDGEMENTS

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