Original Article

General Health Status of Thai Monks Living in Bangkok Metropolitan Temples

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Objective: To assess general health status of Thai Monks living in the temples in the Bangkok Metropolitan Area and its influencing factors.

Materials and Methods: This cross-sectional survey study was conducted from September 2017 to November 2017. The monks who lived in temples in in Dusit and Nong Chok districts of Bangkok were invited into the study. The monks who consented to participate in the study filled out a questionnaire which queried about personal and health data before undergoing physical examination and basic laboratory investigation. Data of general health and factors which may affect health were collected and analyzed.

Results: A total of 214 monks consented to participate in this study. The mean age was 43.7±18.29 years (51.9% aged 40 years and over). Good habit of food consumption was found in 56.7% whereas the overall daily physical activity was 75 minutes (range, 33 to 300 minutes). Concerning the negative influence, 51.9% reported alcohol/liquor drinking before entering into the monkhood whereas 50.9% had ever been smoking with a median of 5 pack-years (range, 0.05 to 64.0 pack-years) lifetime tobacco exposure. Approximately 93% reported one or more medical illnesses or symptoms of their concern. Physical examination revealed slightly 51.2% were overweight or obese. Systolic and diastolic pressure ≥130 mmHg and ≥85 mmHg were found in 43.5% and 30.9%, respectively. Among the basic laboratory investigations, dyslipidemia was most frequently found (79.5%) followed by elevated fasting blood sugar (31.9%). High to severe degree of stress was demonstrated in 29.3%.

Conclusion: The monks living in the Bangkok Metropolitan Area had suboptimal health status, with 93% reporting personal illnesses or complained of symptoms about their health. Factors which may affect their health were history of drinking, ever smoking, low physical activity, overweight or obesity, dyslipidemia, high fasting blood sugar and stress. The monks and the related health sectors should have awareness to prevent or to reduce the negative habit and abnormal health conditions.

Keywords: Thai monk, Urban area, General health

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Buddhism is the most common religion in Thailand, with nearly 40,000 temples and 30,000 monks across the country as of 2016[(1)]. A monk is an ordained male monastic in Buddhism. Monkhood, which is considered an honor to one's life, is regarded highly in the society. The duration of this monkhood may last for days, weeks, months, or years. Some monks may choose to remain their monkhood for lifetime. The monk dedicates their living to religious practice, and is expected to play certain roles in the Buddhist community. The most important ones are to preserve the doctrine/discipline of the Buddha and to teach Dharma to people in appropriate occasions.

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The pre-requisites, aside from being male, other requirements are being 20 and older, being independent or having a permission to become a monk from the parents or superior, having no debts, and having no infectious diseases of leprosy, tuberculosis and epilepsy[(1)]. The monk has to follow the 227 strict precepts or rules of conduct, and is expected to live with minimum possessions[(2)]. Generally, the lay followers will voluntarily provide things that the monk required for daily living including food.

Daily activities of the monks, which are distinct from lay persons, usually follow the same pattern if not involved in the activities outside the temple[(2)]. These take a lot of discipline. Starting early morning around 4 AM, the monks meditate and chant before going around the neighborhood by walking barefoot with a bowl to receive the alms (food in general) which people humbly provide with respect. Upon returning to the temple, the monks have breakfast, then make a blessing. Some monks may have lunch which must be before noon. In the afternoon, all solid foods

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are prohibited until sunrise of the following morning and only liquid drinks e.g. water, milk or herbal tea, etc. are allowed. In the afternoon to late evening, the daily chores are performed as well as learning Buddhist teaching followed by session of meditation and prayer. The activities generally end around 8 to 9 PM of each day.

General speaking, these unique daily activities of the monks are considered as being healthy. Living modestly and having conscience with regular mind discipline are positive psychological impacts. By the same token, having moderate food intake, abstinence from unhealthy food or beverages consumption, and daily physical activity/chores will result in physical well-being. However, some monks may be at stake of health problems if the precepts are not well followed or in the monks who may already have had personal illnesses. These problems, if are not aware or appropriate measures are not taken, may be harmful to health.

Along with the general urban population, non-communicable diseases e.g. cardiovascular and metabolic diseases were also common diseases/disorders among Thai monks. Data from national health survey among the monks all over the country by the Department of Health, Ministry of Public Health in 2011 showed that 30% and 25% of 350,000 monks had one or more health problems or were at risk of illnesses. Approximately 36% of 17,381 monks who sought medical care at Priest Hospital had problems of diabetes mellitus (18%), hypertension (17%), and dyslipidemia (14%); nearly 15% had dental or oral cavity problems[3].

Some of these non-communicable diseases lie partly on the type, especially, of unhealthy food consumption[4-7]. Other unique activities of the monks which are different from laymen may be the underlying reasons for some health problems e.g. sitting in certain position for too long resulting in knee or joint pain[8], excessive exposure to incense smoke leading to lung disease[9,10], walking barefoot on dirty streets resulting in wounds particularly in diabetic monks[11], and etc. Some risks may be unique to urban area like Bangkok, such as, out-door air pollution etc[12,13]. Another unique task of the monk is being a consultant for people with problems and stress. Regular listening and verbally comforting people may cause stress to the monk himself and may impact his quality of life[14].

Other studies also assessed the health status of monk in various regions of the country, however, in different health aspects e.g. knowledge, practice, food habits etc[15,16]. Different cultural practices or believes as well as some demographic background e.g. socioeconomic status, education etc of the population including laymen and monks in that areas certainly influence their health. Focusing on the Bangkok Metropolitan Area which is the capital of Thailand, few studies in certain districts were reported, focusing specifically on food habits, nutrition, or exercise[4-7,17].

Health problems among Thai monks have been recognized, the Health Charter for Buddhist Monks supported by many organizations aiming to have healthy monks, established temples and happy communities[3,18].

Our institution is responsible for health promotion and care for people in Bangkok and around the country. With a special emphasis on urban medicine, many health aspects and disorders related to urban setting are focused. Because the monks are considered as spiritual leaders of people in the society, their good health and well-being are important. With different ways of living in urban and rural areas, we aimed to assess the general health status of Monks living in temples in the Bangkok Metropolitan. The health status included daily lives pattern (habits, food consumption, physical activity), psychological (stress, quality of life), and physical status (history of illnesses/symptoms and abnormal health findings). Other parallel studies in this large project of health survey focusing on specific health systems were reported in detail elsewhere.

Materials and Methods

Subjects

This cross sectional survey study was conducted from March 2017 until November 2017. Approximately a total number of 250 monks living in temples in Bangkok was planned. The temples in Dusit and Nong Chok districts were arbitrarily selected. An approval from the Ethics Committees for Human Research of the institution was obtained. Inclusion criteria were Thai monks who aged 35 years old and above, having been ordinated for at least 1 year, and being literate in Thai. Exclusion criteria were the monks who were not present willing to participate or were not in the temple at the day of survey.

Methods

Our research assistant contacted the abbots of each temple in the 2 districts. The ones who agreed to participate in the project were scheduled for the sites visit. Details of our health survey project were given to all monks in each temple few days ahead of the schedule. The monks who met inclusion criteria and were willing to participate received the health survey questionnaire. Each item in the questionnaire was explained and clarified with the monks who were requested to fill them out prior to the date of health check up at the temple. All monks signed written informed consent.

Our health survey comprised of 3 parts: 1) general demographic and history of health data collected by self-administered questionnaire including: age; years of ordination; regular and dharma education; marital status prior to ordination; history of illnesses and symptoms/complaints; food habits; exposure to unhealthy habits or environments e.g. smoking, alcohol drinking; 2) general physical examination included assessment of body build, vital signs including blood pressure, and examination of skin and eye; Psychosocial well-being of stress and quality of life (QoL) were assessed using Suanprung Stress Test SPST 20 and WHOQOL – BREF – THAI questionnaire respectively[19], and 3) basic laboratory tests including: complete blood count and blood chemistry of fasting blood sugar, lipid profiles, liver and renal function tests, uric acid, and serum markers for hepatitis.

On the scheduled day, the research team comprising

of doctors, nurses, and research assistants went to the participating temple. The research assistants collected and verified the completion of questionnaires. Blood samples were collected in the morning and were sent to laboratory of our hospital within 1 to 2 hours. Physical examination included assessment of weight, height, waist circumference, and blood pressure measurement. Skin examination was conducted by one dermatologist. For eyes examination, an ophthalmologist measured the visual acuity of both eyes with the Early Treatment Diabetic Retinopathy Study (ETDRS) chart, uncorrected and spectacles corrected, through pinhole, and with an auto-refractor. The ocular pressure was measured with a non-contact tonometry whereas the retina was screened by examining the photos taken by the non-mydriatic fundus camera.

The monks who had minor abnormal physical findings e.g. common skin lesions, colds, and etc were treated with ambulatory medical kits. Those who had abnormal conditions or abnormal visual screening tests requiring further investigation and/or treatment would be invited to the hospital. All physical and laboratory findings along with the recommendation would be summarized in the provided personal health books given to each participating monk within a month.

Data collection and statistical analysis

Demographic and history of health data, findings from physical examination and/or laboratory investigations were collected. Data were analyzed using SPSS 22.0 statistical software (IBM Corporation, Armonk, NY, USA). Demographic data were analyzed by descriptive statistics and presented as number with percentages, mean with standard deviation (SD) or median with range. Outcomes of interest in this study were general health status of the monks, presence and frequency of illnesses and symptoms reported by the monks themselves, and abnormal findings from physical and laboratory examinations.

General health status of the monks was defined in the present study as optimal when the prevalence of self-reported illnesses/symptoms was less than 50%. Food habit was considered as good when the score was over mean score plus 1 SD. Stress which was categorized as 4 levels was grouped into 2 levels in this report: low-moderate and high-severe according to the test score. Quality of life which was primarily divided into physical, psychological, social, and environmental aspects was summarized in this report as overall QoL.

Data findings of each system and their association with other clinical features were detailed in other parallel studies and presented elsewhere.

Results

A total of 214 monks were consent to participate in this study: 106 from Dusit and 108 from Nong Jok districts. The mean age was 43.7±18.29 years (51.9% aged 40 years and over). Among 199 monks with available data, they had been ordained for a median period of 5 years (range, 1 to 63 years). More than two-third (71.1%) were single prior to the ordination. Most monks had education in standard school of secondary level (45.8%) followed by bachelor degree and higher (26.9%). Regarding Dharma education, 63.9% graduated basic course whereas 5.3% had advanced levels and 20.8% did not study in this area. The two most common reasons for becoming the monk were their own will to dedicate their lives to religious practice and as a gratitude for their parents, 57.5% and 36.9%, respectively. Table 1 shows demographic data of the monks included in the study.

Table 2 demonstrates the behaviors which may have impacts on health. Regarding the food habits, 56.7% were found to have good food consumption habit. From the 3 habits which were considered healthy, 19.5% had high consumption of less processed rice (brown rice, coarse rice, and etc), 34.2% had preference and consumption of high fiber diets (fruits and vegetables), and 61.4% drank adequate water each day (6 to 8 glasses). For physical activity, the median duration of overall daily physical activity was 75 minutes (range, 33 to 300 minutes). Concerning the negative influence, 51.9% reported one or more kinds of liquor before entering into the monkhood. The median duration of drinking was 10 years (range, 1 to 60 years) with a median amount of 1 glass/day (range, 1 to 9 glasses/day). Among 109 monks (50.9%) who had ever smoking, 37.4% still smoked whereas 13.6% had quit. The median duration of smoking (in all current smokers and quitters) was 15 years (range, 1 to 60 years). The median value of lifetime tobacco exposure was 5 pack-years (range, 0.05 to 64.0 pack-years).

From the questions about personal illnesses or symptoms, 198 monks (92.5%) reported one or more medical illnesses or symptoms of their concern. The 3 most common

Table 1. Demographic data of the monks and their food habits

Features	Number	%
Regular education (n = 212)		
None	5	2.3
Primary school	53	25.0
Secondary school	97	45.8
Bachelor and higher	57	26.9
Dharma education (theology) (n = 207)		
None	43	20.8
Basic	153	73.9
Advanced	11	5.3
Prior marital status (n = 211)		
Single	150	71.1
Married	38	18.0
Divorced	23	10.9
Reason of ordination (n = 214)		
Self-intention	123	57.5
Act of gratitude to parents	79	36.9
Others*	12	5.6

* Others included being coerced by the superior, personal issues, or not otherwise specified

Table 2. Behavioral factors which had positive or negative impact to health (n = 214)

Factors	n	%
Positive impact		
Food habits, mean score ± SD (n = 210)	47.0±7.00	
Good*	119	56.7
Modest to poor	91	43.3
Physical activity; median, range (min)	75 (33 to 300)	
Walking around for the elms (n = 17)	45 (30 to 90)	
Walking in the temples (n = 70)	30 (5 to 180)	
Sweeping/plants watering (n = 106)	30 (3 to 240)	
Negative impact		
Past history of drinking (n = 214)	111	51.9
History of cigarette smoking (n = 214)	109	50.9
Quitted smoking	29	13.5
Currently smoking	80	37.4
Daily exposure to smoking to scent sticks (n = 122); median, range (min)	30 (2 to 300)	
≤30 minutes	66	54.1
>30 minutes	56	45.9

* Good food habit included those who had habit score over the mean score ± SD

illnesses were hypertension (13.5%), diabetes mellitus (10.5%), and dyslipidemia (9.0%). Regarding the symptoms, respiratory and joint/knee were the 2 most common systems of complaints. Table 3 shows data of illnesses or symptoms the monks responded in the questionnaires.

Physical examination showed the monks had median body weight and mean BMI of 68.1 kg (range, 37.9 to 154.0 kg) and 25.6±5.25 kg/m^2, respectively. The median waist circumference was 82.5 cm (range, 54.0 to 147.0 cm). Of note, slightly over half (51.2%) were overweight (25 to <30 kg) or obese (≥30 kg) and nearly one-third (29.6%) had waist circumference ≥90 cm. Although the median systolic and diastolic blood pressure values were within normal limit, 43.5% and 30.9% were found to have systolic and diastolic pressure ≥130 mmHg and ≥85 mmHg, respectively. Abnormal eye examination or skin lesions were reported in 58.6% and 74.0% with refractive errors and facial melasma as the most common abnormal findings, respectively. Findings from physical examination are shown in Table 4.

Among the basic laboratory investigations (Table 5), dyslipidemia was most frequently found (79.5%) followed by elevated fasting blood sugar (31.9%). Of note was abnormal renal laboratory findings which were incidentally discovered in approximately 10%. The other laboratory derangements are demonstrated in Table 5.

Regarding the psycho-social status of the monks, slightly more than one fourth (29.3%) reported high to severe degree of stress but only 2.5% reported poor quality of life. The problems involved more of personal issues than the interaction between family members or the other persons in the temple. Findings on stress, quality of life, and psycho-social problems are shown in Table 6.

Discussion

The present study revealed that the monks living in the Bangkok Metropolitan Area had suboptimal health status. An overview of basic features of the monks along with general health status and prevalence of abnormal health findings were presented here whereas the detail of the abnormalities as well as their association with the characteristic features of the monks or with other findings would be presented in detail elsewhere.

Approximately 93% of the monks reported one or more of known medical illnesses or symptoms in various systems. The 3 most common illnesses the monks reported were hypertension, diabetes mellitus, and dyslipidemia (accounting for approximately 10% of each). The present study collected data of symptoms/complaints the monks had aside from the illnesses because they affected the well-being state of the monks as well. Furthermore, they might represent or precede the unrecognized illnesses. The authors found chest pain or tiredness and joint pain or stiffness as the two most common complaints of the monks. Being a survey study prohibiting a thorough physical examination, our team had advised the monks who had these symptoms to seek for medical consultation in the hospital for further investigations as appropriate.

Upon examination, skin lesions (74%) overweight/obesity (51%), and abnormal findings of eyes (59%) were the 3 most common abnormal physical examination findings (Table 4). Along with the overweight/obesity, 30% had large waist circumference whereas 44% and 31% had high systolic and diastolic blood pressure. Laboratory investigation additionally discovered 80% of the monks had dyslipidemia and 32% had high fasting blood sugar. The frequency of abnormal examination findings (Table 4 and 5) far exceeded those self-reported corresponding illnesses (Table 3). The examples were those of skin, eyes, dyslipidemia, fasting blood sugar, and renal dysfunction. Being a survey study, the authors could not explored in detail whether the monks with these

Table 3. History of self-aware of personal illness or symptoms of the monks

System of symptoms or illnesses	n	%
Cardiovascular (n = 200)	30	14.5
Cardiac	5	2.5
Hypertension	27	13.5
Respiratory (n = 214)	159	74.3
Respiratory symptoms[1]	89	41.6
Chest pain or tiredness[2]	129	60.3
Chronic obstructive pulmonary diseases e.g. asthma, emphysema	12	5.6
Abnormal pulmonary lesions e.g. fibrosis or TB	7	3.3
Metabolic (n = 200)	34	17.0
Diabetes mellitus	21	10.5
Dyslipidemia	18	9.0
Neuromuscular (n = 200)	12	6.0
Stroke	1	0.5
Numbness	11	5.5
Digestive (n = 213)	51	23.9
Fatty liver (n = 200)	2	1.0
Chronic viral hepatitis (n = 200)	6	3.0
Defecation problems[3] (n = 213)	46	21.6
Renal (n = 200)	12	6.0
Renal disease, not otherwise specified	2	1.0
Nocturia	10	5.0
Joint/knee (n = 209)	110	52.6
Joint pain/stiffness (n = 198)	97	49.0
Gout (n = 200)	6	3.0
Osteoarthritis (n = 200)	6	3.0
Others[4] (n = 198)	38	19.2
Eyes (n = 200)	21	10.5
Blurring of vision	11	5.5
Glaucoma	8	4.0
Cataract	6	3.0
Macular degeneration	3	1.5
Skin pruritus, sore or tingling (n = 218)	34	15.6

[1] Respiratory symptoms included chronic events of cough, sputum, dyspnea, wheezing or hemoptysis
[2] Chest pain and tiredness presented in the respiratory system may have underlying abnormality in other systems
[3] Defecation problems included chronic constipation/ hard stool, hemorrhoids, tenesmus, or bleeding per rectum
[4] Other joint/ knee diseases included swelling or cracking sound on moving
Note: One monk may have one or more symptoms or illnesses

physical or laboratory findings had been diagnosed with illnesses but were not well aware (forgetting/negligence) and not adhered to the treatment given, or were primarily detected.

Our finding of non-communicable diseases as being common was concordant to national-based data from the Department of Health which found hypertension and diabetes mellitus in approximately 17 to 18% of each, and dyslipidemia in the other 14%[3]. These problems of diabetes mellitus, hypertension, dyslipidemia, and obesity comprise the condition known as metabolic syndrome[20]. From a series of national health survey across Thailand, the prevalence of these conditions were found higher in urban or the Bangkok Metropolitan Area compared to rural areas[21-23].

Generally speaking, health status of the monks is influenced by many factors e.g. age, activities or behaviors of a monk, diet, and the location of the temples (rural or urban). Most of the times, these factors are inter-related and contribute to the state of health. Aged individuals frequently have degenerative changes and/or cumulative body function disorders. Some other features of the individuals may accelerate or contributed further to the pathologic changes, such as, obesity, hypertension, metabolic disorders etc. Possible reasons of a high frequency of illness or complaints of the monks in our study (93%) was the age and its associated degenerative changes because 52% of the monks in our study aged 40 years and over.

Aside from aging, additional detrimental factors which were encountered more in monks than laymen were the unhealthy food habits and/or limited physical activity. Regarding the food habits, our study found that 43% had modest to poor food habits (details of food habit were presented elsewhere). The suboptimal food habit of the monks was consistent with previous study which reported moderate level of consumption behavior[4]. The foods the

Table 4. Findings found from physical examination of the monks (n = 214)

General	n	%
Body build (n = 207)		
Weight; median, range (kg)	68.1 (37.9 to 154.0)	
Height, mean ± SD (cm)	165.8±7.74	
Body mass index; mean ± SD (kg/m^2) (n = 207)	25.6±5.25	
<18.5	13	6.3
18.5 to <25	88	42.5
25 to <30	67	32.4
≥30	39	18.8
Waist circumference, median, range (n = 162)	82.5 (54 to 147)	
<90 cm	114	70.4
≥90 cm	48	29.6
Home blood pressure (mmHg) (n = 207)		
Systolic blood pressure, median (range)	129 (88 to 272)	
≥130	90	43.5
Diastolic blood pressure, median (range)	80 (50 to 135)	
≥85	64	30.9
Abnormal eye examination* (n = 198)	116	58.6
Refractive errors	96	48.5
Non-refractive errors	29	14.6
Skin lesions (n = 192)	142	74.0
Eczema	42	22.8
Infection	9	4.9
Acne	40	21.7
Melasma	67	36.4
Xerosis cutis	50	27.2
Corn/callus	57	31.0
Others**	12	6.5

* Refractory errors of eyes included near- and far-sighted vision, presbyopia, and astigmatism whereas non-refractive errors included strabismus, glaucoma, cataracts, vitreous degeneration, diabetic retinopathy, and blindness
** Other abnormal skin findings included psoriasis, urticaria, alopecia areata, and actinic keratosis
Note: One monk may have one or more symptoms or illnesses

monks had were generally provided by laymen[4]. Although they were usually of high quality or expected to be tasty, they were found to be of low to modest quality[5]. These unhealthy foods were, for example, being salty (76%), enriched with fat from coconut milk (57%), deep fry cooked (40%)[4], having a deficiency in vegetables/fruits or incomplete nutrient types[5], or high in sugary drinks[7]. The monks, who were not aware of mediocrity and did not have high self-discipline as has been the principle of living in Buddhism, may have unfavorable health conditions.

Concerning the physical activity, our study found daily physical activity of the monks ranged from 33 minutes to 300 minutes (median 75 minutes) (Table 2). The present study did not explore the reasons for inadequate physical activity. This may be because the monks in urban temples had more sedentary lifestyle requiring less physical exertion on daily works than those in rural temples[24] or aging/illnesses of the monks themselves prohibiting physical exertion. These factors might be explored in further studies.

Aside from the poor food habits and limited physical activity, the daily unique activity of the monks e.g. squatting, sitting in hunker or cross-legged for long duration in the temples may cause some health problems especially joint and knees symptoms. The present study found 53% of the monks had complaints of joint/knee; 49% were about pain and stiffness. Health personnel may consider specific education about self-physical rehabilitation e.g. stretching exercise of this system.

Other behaviors e.g. history of alcoholic drinking and smoking are also harmful to health[25]. Our study found approximately half of the monks had past history of drinking, or ever been smoking. This was evidenced in our study which revealed respiratory symptoms (Table 3) and elevated liver enzymes (Table 5). These unfavorable behaviors and their sequelae should be attended to e.g. campaigning for smoking cessation among the monks should be carried out as having been solicited in the general population, surveillance for liver abnormality for those with a history of alcohol consumption and for respiratory system for the smokers etc.

The present study demonstrated that the monks had daily exposure to smoke from the incense for an average of 30 minutes, with 46% exposed for longer durations. Burning the incense is one common act in Buddhism and some other religions as the worship to the Buddhist. Actually, this was considered as harmful to the monks or laymen attending the temples especially if it was done in close spaces

Table 5. Abnormal findings from laboratory investigation of the monks (n = 210)

Abnormal laboratory test	n	%
FBS ≥100 mg/dL	67	31.9
Dyslipidemia*	167	79.5
Abnormal renal function test		
BUN 20 mg/dL	22	10.5
Creatinine >1.2 mg/dL	22**	10.5
eGFR < 60 ml/min	17	8.1
Urine albumin/ creatinine ratio ≥30 mg/g	26	12.4
Abnormal liver function test		
AST (SGOT)	33	15.7
ALT (SGPT)	27	12.9
ALP	13	6.2
Abnormal uric acid >7 mg/dl	53	25.2
Positive markers of hepatitis		
Hepatitis B antigen	5	2.4
Hepatitis C antibody	3	1.4

* Dyslipidemia included any value higher than upper normal limits of cholesterol (>200 mg/dl), triglyceride (≥150 mg/dl), LDL (>100 mg/dl), or lower than low normal limit of HDL (<40 mg/dl)

** The individual monks who had abnormal creatinine may be different from those who had abnormal BUN

Note: One monk may have one or more symptoms or illnesses

Table 6. Summary of psycho-social problems including stress and quality of life of the monks (n=214)

Psycho-social findings	n	%
Stress (n = 205)		
Low to moderate	145	70.7
High to severe	60	29.3
Poor quality of life (n = 200)	5	2.5
Problems (n = 205)		
In the family	35	17.1
In the temple	28	13.7
Personal problems*	42	20.5

* Personal problems involved financial issue and educational achievement

with inadequate ventilation. Previous studies reported incense smoke exposure was harmful, inducing respiratory disease or even cancer[9,10]. A measure of using electronic stick or candles has been used in some temples and should be solicited of other temples as well.

The food imbalance, inadequate physical activity, or different activity of the monks from laymen certainly had negative influence on health. These data should be relayed to the public. Campaign laymen to provide healthy foods to the monks should be conducted. The authorities involving the monk health care may encourage and incorporate appropriate physical activity into the monks' daily schedule especially in urban temples.

Aside from the factors of the monks themselves, hazardous environments especially air pollution which is more common in urban than rural areas contribute further to the unhealthy conditions[12]. An example was the poor air quality or PM 2.5 which has been a major health threat to Bangkok habitants[13]. All individuals including the monks should be conscientious of a conservatory approach in reducing all related causes.

Lastly, the present study demonstrated approximately 29% of the monks had high or severe degree of stress. This was found as a common problem in urban area where people including the monks may have hustling life from traffic or high competition[24]. Although the monks had 227 strict precepts to follow, it would be difficult for those who had not been enlightened to be free from stress. The authors did not find much data of this issue in other studies of monks.

The present study had some limitations. First, our data were from only a few districts in Bangkok. The authors did not know if our data could represent information of all monks in Bangkok which is a large city which has a diversity of urbs and suburbs. More data were needed. Second was the health concern of the monks themselves. Being highly respected by the community, some monks may regard health as a minor issue. This was indirectly evidenced in the present study that abnormal findings from physical and laboratory examinations were higher than the corresponding self-reported illnesses. And lastly, data of treatment for known illnesses could not be collected and the authors did not know whether the monk had not ever been treated or they had poor adherence to the treatment given. The authorities may consider a health promotion, screening, and early detection of illnesses especially those who had risk factors. The policy by the Health Charter for Buddhist Monks to establish healthy monks, temples and happy communities in 10 years are being carried out to combat the high rate of non-communicable diseases among monks[18]. Every party should collaborate in this achievement.

The strength in the present study was systemic general health data were evaluated altogether in order to have an overview of monks' health status. Furthermore, symptoms of their concern were also assessed aside from recognized illness. These various problems may be attended to before progression to actual illnesses.

Conclusion

The present study found suboptimal general health condition of the monks living in Bangkok. Modern ways of livings may have tempted to the unhealthy living of both the population and the monks in urban areas. Further study of health problems in other urban areas which may be unique and distinct from those in rural areas due to different patterns of livings should give more direct answer. As of now, a high frequency of recognized illness and symptoms complained of as well as the exceeding numbers of abnormal physical and laboratory findings of the systems the monks self-reported, should alert the responsible health sectors to focus more on the monk population.

What is already known on this topic?

Previous studies reported health data of the monks in Thailand in various issues. Each study focused on particular topic of interest e.g. food habit, exercise and illnesses. Furthermore, data from previous studies were derived from different regions of the country.

What this study adds?

The present study evaluated the general health status of the monks in the Bangkok Metropolitan Area in order to provide a large picture of their health. Brief data of daily physical activity, food habit, illnesses or complaints, findings from physical and laboratory examination revealed suboptimal conditions of the monks' health. High prevalence of medical abnormalities including stress were found.

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Potential conflicts of interest

The authors declare no conflicts of interest.

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