



High Sodium Intake among Buddhist Monks: Relationship with Waist circumference, Blood Pressure, Cardiovascular Disease Risk, and Chronic Kidney Disease Risk

Benjamas Suksatit, Phraratsittivetee, Chompunut Singmanee,
Warodom Samerchua, Somboon Jeenapongsa,
Purida Wientong, and Nipawan Waisayanand

THAILAND





**“If you would like to take care of me, you
should take care of monks who get sick”**

**ผู้ใดจะฟังอุปัฏฐากเรา
ผู้นั้นฟังพยาบาลภิกษุอาพาธ”**



Background

Sodium



one of the essential nutrient for sustaining health by involving in vital physiological processes

However, either low or excessive sodium intake may affect health status.

Buddhist monks and NCDs



**Prevalence of
NCDs in Buddhist
monks**

**Challenges in health
behaviors**





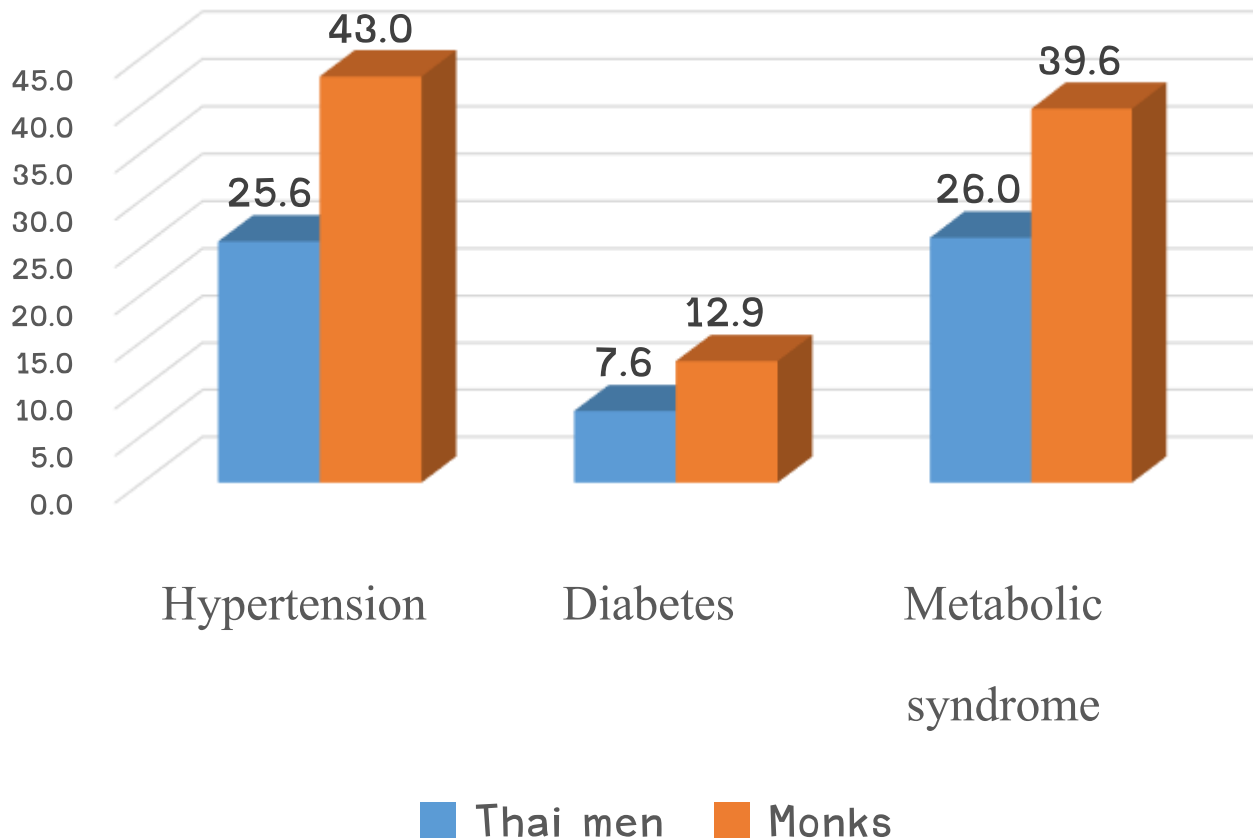
NCDs among Buddhist monks

- We did a **situational analysis of NCDs** and related factors among Buddhist monks in Phichit province, Thailand.
- The results show that the incidence of NCDs among monks is **higher** than those among Thai men.





NCDs: Thai men vs. Monks





The 2017 Health Charter for Buddhist Monks



The 2017 Health Charter for Buddhist Monks was introduced, aiming to make a difference in 10 years towards healthy monks, established temples and happy communities.



Objectives

- 1) to estimate the dietary sodium intake in Buddhist monks
- 2) to examine its relationships with waist circumference, blood pressure, cardiovascular disease (CVD) risk, and chronic kidney disease (CKD) risk





Methodology

- **Study design:** this study was a cross-sectional survey study among Buddhist monks in Phichit province, Thailand.



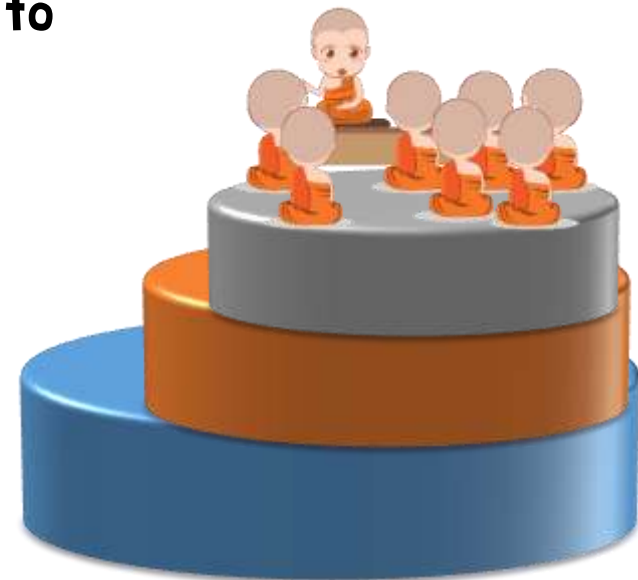
Methodology: Participants

Network sampling to identify possible subjects

Sangha council of Phichit, Thailand, approached eligible subjects.

Those who were interested were introduced to researchers.

378 monks, who age at least 20 years, agree to participate and provided consent.





Measurements

- Demographic data
- WHO STEPS Instrument:
 - Step 1 Behavioral measurement
 - Step 2 Physical Measurement
 - Step 3 Biochemical Measurement
- Thai CVD and CKD risk score calculator: web-based, application



Estimated dietary sodium intake

- calculated by INTERSALT equation using urine sodium, urine creatinine, age, and body mass index.


Estimated 24 hour sodium (Na) intake in mmol for males: $23.51 + 0.45 * \text{spot Na concentration (mmol/L)} - 3.09 * \text{spot creatinine concentration (mmol/L)} + 4.16 * \text{BMI} + 0.22 * \text{Age}$

The 24 hour sodium values in mmol are divided by 17.1 in order to get grams of salt.

Thai CVD risk score (without blood component factors)



← → ↻ 🏠 🔒 https://med.mahidol.ac.th/cardio_vascular_risk/thai_cv_risk_score/ 🗨️ ☆ 🗑️


Thai CV risk score

ข้อมูลที่จำเป็น (ต้องกรอกทุกข้อ)

อายุ	<input type="text" value="35"/>
เพศ	<input checked="" type="checkbox"/> ชาย <input type="checkbox"/>
สูบบุหรี่อยู่	<input type="checkbox"/> ใช่ <input checked="" type="checkbox"/> ไม่
เป็นโรคเบาหวาน	<input type="checkbox"/> ใช่ <input checked="" type="checkbox"/> ไม่
ความดันโลหิตตัวบน	<input type="text" value="120"/> <input type="range" value="120"/>

CVD risk factors such as age, gender, smoking, diabetes, and BPs were employed to calculate CVD risk score.



Thai CKD risk score (without blood component factors)

Thai CKD risk score

ข้อมูลที่จำเป็น (ต้องกรอกทุกข้อ)

อายุ	<input type="text" value="38"/>	<input type="range"/>
เพศ	<input checked="" type="radio"/> ชาย <input type="radio"/> หญิง	
ความดันโลหิตตัวบน	<input type="text" value="120"/>	<input type="range"/>
เป็นโรคเบาหวาน	<input type="checkbox"/> ใช่ <input checked="" type="checkbox"/> ไม่	
วัดรอบเอว (นิ้ว)	<input type="text" value="30"/>	<input type="range"/>

CKD risk factors such as age, gender, BPs, history of diabetes, and waist circumference were employed to calculate CKD risk score.



Methodology

- However, Thai CVD risk score required at least **35** years of age and Thai CKD risk score required at least **38** years of age. Thus, only data from **130** monks were included for calculating to estimate 10-year CVD and CKD risk.
- Data were analyzed by descriptive statistics, and Spearman correlation coefficients.



Protection of the rights of human subjects

- This study was conducted with the approval of the Institutional Review Board (IRB) of Mahachulalongkornrajavidyalaya University, and the IRB of Phichit hospital, Thailand to assure the protection of human subjects.
- Confidentiality of all information was maintained.
- All data was analyzed and reported as group data.

Results

- 130 monks participated in this study.
- Mean age was 52.42 (SD = 8.53).
- Number of year being ordained was between 1 to 47 years (\bar{x} = 13.16).
- Although the majority earned primary school, they finished dhamma scholar advanced level. However, less than 10% studied Pali.





Results

- Dietary sodium intake
 - The average estimated sodium intake was 3.96 grams per day.
 - Ninety-eight percent of monks had a consumption of dietary sodium higher than the daily recommended ($\leq 2,300$ mg/day).

Results: CVD risk



- Approximately 42 percent of monks had 10-year CVD risk at least or more than 10 percent.

High: ≥ 20

20.0%



Moderate: 10.00 - 19.99

22.3%



Low: < 10.00

57.7%



= 2

Results: CKD risk



- Approximately 42 percent of monks had 10-year CKD risk at least or more than 10 percent.

High: ≥ 20

67.7%



Moderate: 10.00 - 19.99

24.6%



Low: < 10.00

7.7%



Results



waist circumference ($r = .59, p = .001$)



BPs ($r = .27, p = .002$)



CVD risk ($r = .28, p = .01$)



CKD risk ($r = .37, p = .01$)

**Sodium
intake**

Conclusion



↑ CVDs & CKD
Prevention
& Care

↑ Awareness
Health alms food

Sodium Intake are
correlated with risk
for CVDs and CKD





Implications for Nursing

- Urgent nursing intervention, such as health education, public campaign etc, is needed for Buddhist monks and followers to raise awareness and reduce sodium in alms food.





Acknowledgement

- The Ecclesiastical Provincial Governor of Phichit , along with the Buddhist Sangha administrative officers, and all respectful Buddhist monks for supporting and participating in the study.
- Thai Health Promotion Foundation, the Buddhist Research Institute, Mahachulalongkornrajavidyalaya University, and the Ecclesiastical Provincial Governor of Phichit for financial support.

Q & A





Thank you! ขอบคุณค่ะ