A RELATIONSHIP BETWEEN HEALTH STATUS AND SALT CONSUMPTION BEHAVIOUR AMONG VILLAGE HEALTH VOLUNTEER IN SIRACHA, CHONBURI

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Abstract

Background: Excessive salt consumption is a major public health concern globally and a key contributor to NCDs e.g. hypertension, cardiovascular disease, and kidney disease. Village Health Volunteers (VHVs), who play an essential role in community health promotion, are expected to model healthy behaviours, including appropriate salt consumption. **Aim:** This study aimed to determine the relationship between health status and salt consumption behaviour among VHVs in Siracha, Chonburi. **Method:** A total of 752 VHVs were surveyed using structured questionnaires between March and May 2025. Descriptive statistics were used to summarise demographic and health data, while Pearson's correlation was applied to examine relationships among demographic factors, blood pressure, body mass index (BMI), and salt consumption behaviour. **Results:** This study revealed that most participants were female (84.3%) and over 50 years old (66.7%). More than 60% had elevated systolic blood pressure, and 70% were either overweight or obese. In terms of salt-related behaviour, 73.5% demonstrated only fair practices, with just 2.5% showing excellent salt consumption behaviour. Significant correlations were found between salt consumption behaviour and age, education, and BMI, indicating that older, less educated, and overweight individuals were more likely to exhibit poor salt consumption habits. **Conclusions:** This study reported that the majority were older, low-income females with elevated blood pressure, high BMI, and generally poor salt consumption behaviours. The findings clearly demonstrate significant associations between salt intake behaviour and key health indicators including BMI, blood pressure, age, and education level. These results suggest that VHVs with poorer salt consumption practices tend to have higher BMI and blood pressure, particularly among older and less educated individuals, highlighting the need for targeted interventions to improve both health behaviours and outcomes in this population.

Keywords: Knowledge, salt consumption, health status, village health volunteer

Introduction

Salt consumption has become a growing public health concern globally, as it is a key contributing factor to major non-communicable diseases (NCDs). Salt, which primarily consists of sodium, is essential for the body, as sodium helps regulate fluid balance, neurotransmission, and muscle function. However, excessive salt intake increases the risk of cardiovascular disease, hypertension, and kidney disease.

The World Health Organization (WHO) (World Health Organisation, 2020) recommends limiting sodium intake to no more than 2,000 milligrams per day, equivalent to 5 grams of table salt, to reduce the risk of NCDs. Consumption of high-sodium foods whether through added salt in manufacturing processes, food sold in restaurants, or meals prepared at home has broad health implications, particularly in low- and middle-income countries, where the prevalence of NCDs continues to rise.

Hypertension, a major NCD linked to high salt intake, is often called the "silent killer" because it typically shows no symptoms. Yet, it significantly increases the risk of stroke, paralysis, ischemic heart disease, and other cardiovascular-related conditions. Studies have shown that reducing salt intake leads to a decrease in blood pressure, which in turn reduces the incidence of cardiovascular disease and premature death (Division of Non-communicable Diseases, 2023).

In Thailand, salt consumption patterns also pose challenges, as average intake tends to exceed the daily recommended limit. Common sources include seasoning practices such as the addition of fish sauce, soy sauce, flavoring powders, as well as consumption of high-sodium snacks and processed foods (Division of Non-communicable Diseases, 2023).

According to the Department of Health Service Support (2022), Village Health Volunteers (VHVs) are designated as "household doctors," playing a vital role in community health care. Their responsibilities reflect the scope and efficiency of public health operations at the local level. A key function of VHVs involves the use of digital technologies particularly the Smart VHV application—to support their work and report health care outcomes in a modern, effective manner. This technology enhances both the accuracy and speed of operations and allows for more efficient tracking and evaluation of community health outcomes (Department of Health Service Support, 2022).

Research Objectives

To determine the relationship between health status and salt consumption behaviour among VHVs in Siracha, Chonburi.

Scope of the Research

1. Population Scope

The target population of this study comprised 2,586 VHVs working in Si Racha District, Chonburi Province, according to the Public Health Information System database for the year 2023 (Department of Health Service Support, 2023).

2. Variable Scope

- Independent variable consisted of gender, age, educational level, income, systolic blood pressure (SBP), diastolic blood pressure (DBP), and body mass index (BMI).
- Dependent variable i.e., salt consumption behaviour.

3. Time Scope

Data was collected from March 2025 to May 2025 (2 months).

Research Methodology

This research adopted a quantitative approach to determine the relationship between health status and salt consumption behaviour. A minimum sample size of 503 participants (N=503) was determined using the Taro Yamane formula (Yamane, 1973). Stratified random sampling, as outlined by Elfil and Negida (2017) (Elfil & Negida, 2017), was applied. In this method, the population was divided into specific subgroups (strata), and samples were drawn

from each stratum to reduce selection bias and uphold the principles of probability sampling, thereby enhancing the generalisability of the results.

Data was collected using a questionnaire administered to VHVs from 8 communities in sub-districts of Siracha. The questionnaire comprised of demographic information, such as gender, age, education level, and monthly income. There also included health status information such as SBP, DBP, and BMI. For salt consumption behaviour, 15 questions were obtained as a checklist. The questionnaire was evaluated its content validity. An initial version of the questionnaire was developed and refined during a review meeting to confirm its alignment with the study's objectives. Subsequently, 5 experts assessed the relevance of each item using the Rovinelli and Hambleton method (1977) (Rovinelli & Hambleton, 1977). The Index of Item-Objective Congruence (IOC) was calculated at 0.70. The questionnaire was tried out among 30 VHV cases apart from Siracha. The test for Reliability was aligned with Coefficient alpha (Cronbach, 1951) and reported 0.81. A final consensus meeting was held to complete the questionnaire revision.

1. Research Steps

1.1 Planed data collection across Siracha.

1.2 Informally coordinated with VHV staff to inquire about the procedures, regulations, and methods for data collection, as each facility may have different processes.

1.3 Submit an official request to access the area for data collection.

1.4 Conduct data collection by explaining the objectives and ensuring the protection of volunteers' rights.

1.5 Once volunteers give consent to participate, distribute the questionnaires for self-administration. If any volunteer is unable to complete the questionnaire independently, the researcher will read the questions aloud for them.

2. Data Collection

Data were collected by questionnaire among 800 VHV cases.

3. Data Analysis

Descriptive statistics were used to summarise the general characteristics of participants and to describe the distributions of health status and salt consumption behaviour. The Pearson product-moment correlation (r) was applied to determine the strength and direction of linear relationships between demographic variables (gender, age, education, income), health status indicators (SBP, DBP, BMI), and salt consumption behaviour. The criteria for categorising salt consumption behaviour levels were shown in Table 1.

Table 1 Criteria for categorising salt consumption behaviour levels

Level of salt consumption behaviour	Score (points)	meaning
Excellent	13.0 – 15.0	- Individuals in this category exhibit very good practices in limiting their salt intake. - They likely understand the health risks of high sodium consumption and actively avoid salty foods, read food labels, and may choose low-sodium alternatives.
Good	10.0 – 12.9	- These individuals demonstrate reasonably good habits regarding salt consumption.

Level of salt consumption behaviour	Score (points)	meaning
		- While they may still consume salty foods occasionally, they are generally aware and make efforts to reduce intake.
Fair	Below 10.0	- Individuals in this group may have poor habits related to salt consumption. - They might frequently eat high-sodium foods, add extra salt at the table or during cooking, and lack awareness of the associated health risks (e.g., hypertension, kidney disease).

Research Results

A total of 800 samples were collected. After excluding incomplete responses, 752 participants who completed all questions remained for analysis.

The majority of participants were female, accounting for 84.3% (n = 634), while 15.7% (n = 118) were male. The largest age group was 60–69 years, comprising 34.4% (n = 259) of the sample. This was followed by those aged 50–59 years (32.3%, n = 243), and 40–49 years (14.8%, n = 111). Smaller proportions were found in the age groups 70 years or over (11.4%, n = 86), 30–39 years (4.8%, n = 36), and 20–29 years (2.3%, n = 17). For education, most participants had primary education or equivalent (34.2%, n = 257), followed by lower secondary education (21.8%, n = 164) and below primary education (13.3%, n = 100). Others had upper secondary or vocational certificate level (15.3%, n = 115), high vocational certificate/diploma/associate degree (6.9%, n = 52), bachelor's degree (7.7%, n = 58), and only 0.8% (n = 6) had a master's degree or higher. In addition, over half of the participants, 52.3% (n = 393), reported a monthly income of below 15,000 Baht. Another 37.8% (n = 284) earned between 15,000 and 24,999 Baht. Smaller proportions earned between 25,000 and 34,999 Baht (6.0%, n = 45), and very few participants (less than 2% each) reported higher income levels, with only 0.3% (n = 2) earning 75,000 Baht or more.

The health status and salt consumption behaviour were shown in Table 2. The largest group fell into the "Risk" category of SBP, comprising 47.6% (n = 358) of participants while 38.0% (n = 286) had normal systolic BP and 14.4% (n = 108) had hypertension-level systolic BP. This indicates that more than 60% of the sample had elevated or high systolic BP levels.

For DBP information, we found that the majority, 68.2% (n = 513), had normal DBP, 21.3% (n = 160) were in the risk category, and 10.5% (n = 79) had hypertension levels. Overall, diastolic BP levels were healthier than systolic readings among participants.

Regarding BMI, the largest group was categorised as Obesity Level 1, comprising 37.2% (n = 280), 27.3% (n = 205) had a normal BMI, 22.1% (n = 166) were overweight, while 10.5% (n = 79) were classified as obese (likely Obesity Level 2). Only 2.9% (n = 22) were underweight. This shows that over two-thirds of participants were either overweight or obese.

A vast majority of salt consumption behaviour 73.5% (n = 553), had fair salt consumption behaviour, 23.9% (n = 180) had good behaviour, and 2.5% (n = 19) demonstrated excellent salt consumption behaviour. This suggests a need for improvement in salt intake practices among VHVs.

Table 2 Health status and salt consumption behaviour of VHV

		n	%
Systolic BP	Normal	286	38.0
	Risk	358	47.6
	Hypertension	108	14.4
	Total	**752**	**100.0**
Diastolic BP	Normal	513	68.2
	Risk	160	21.3
	Hypertension	79	10.5
	Total	**752**	**100.0**
BMI	Underweight	22	2.9
	Normal	205	27.3
	Overweight	166	22.1
	Obesity 1	280	37.2
	Obese	79	10.5
	Total	**752**	**100.0**
Salt consumption behaviour	Excellent	19	2.5
	Good	180	23.9
	Fair	553	73.5
	Total	**752**	**100.0**

Considering Table 3, gender showed significant association with SBP (r = -0.1, p = 0.0) and DBP (r = -0.2, p = 0.0), suggesting that females may have slightly lower systolic and diastolic blood pressure. Age showed significantly difference with SBP (r = 0.3, p = 0.0), BMI (r = 0.1, p = 0.0), and Salt consumption behaviour (r = -0.1, p = 0.0). Education showed correlation with SBP (r = -0.2, p = 0.0), BMI (r = -0.1, p = 0.0), and Salt consumption behaviour (r = -0.1, p = 0.0). Salt Consumption Behaviour (as a predictor) showed a positive correlation to BMI (r = 0.1, p = 0.0), suggesting higher BMI may be associated with poorer salt consumption behaviour.

Table 3 Health status and salt consumption behaviour of VHV

			Health and salt consumption status			
			SBP	**DBP**	**BMI**	**Salt consumption behaviour**
General information	**Gender**	r	**-0.1**	**-0.2**	-0.0	-0.0
		p	**0.0***	**0.0***	0.5	1.0
		N	**752**	**752**	752	752
	Age	r	0.3	-0.035	**0.1**	**-0.1**
		p	0.0*	0.3	**0.0***	**0.0***
		N	752	752	**752**	**752**
	Education	r	-0.2	0.053	**-0.1**	**-0.1**
		p	0.0*	0.1	**0.0***	**0.0***
		N	752	752	**752**	**752**
	Income	r	-0.0	0.027	0.0	0.0
		p	0.2	0.5	0.5	0.2
		N	752	752	752	752

		Health and salt consumption status			
		SBP	DBP	BMI	Salt consumption behaviour
Salt consumption behaviour	r	-0.1	0.0	**0.1**	
	p	0.1	0.2	**0.0***	
	N	752	752	**752**	

Discussion

This study examined the health status and salt consumption behaviours of 752 VHVs in Siracha, Chonburi, Thailand, focusing on blood pressure (BP), body mass index (BMI), and dietary habits related to salt intake. The findings provide valuable insights into health risks, demographic distributions, and behavioural tendencies among this specific population group.

Demographic Characteristics

The majority of participants were female (84.3%), which reflects the gender distribution commonly observed among VHVs in Thailand, where women typically take on community health roles. Age distribution was skewed toward older adults, with nearly 70% aged between 50 and 69 years, indicating a largely aging workforce. Educational attainment was generally low, with over two-thirds of participants having only a primary or lower secondary education. Additionally, more than half (52.3%) of respondents reported a monthly income below 15,000 Baht, indicating socioeconomic vulnerability, which can have implications for health literacy and access to health-promoting resources.

Health Status

More than 60% of participants exhibited elevated systolic blood pressure either in the risk range (47.6%) or hypertensive range (14.4%). In contrast, DBP readings were generally better, with 68.2% of respondents having normal DBP. These findings are consistent with patterns seen in aging populations, where systolic BP tends to rise with age due to vascular stiffening.

The majority of participants were above the normal BMI range, with 37.2% classified as Obesity Level 1, 22.1% overweight, and 10.5% as obese (likely Level 2). Only 27.3% had a normal BMI. This highlights a significant burden of overweight and obesity among VHVs, which may increase their risk of non-communicable diseases such as hypertension, diabetes, and cardiovascular disease.

The data indicate that a substantial majority (73.5%) of VHVs had only fair salt consumption behaviour, while just 2.5% demonstrated excellent behaviour. This suggests that despite their role in promoting health within communities, VHVs themselves may not fully adhere to recommended dietary practices regarding salt intake potentially undermining their ability to effectively model and advocate for healthy behaviours.

Correlational Analysis

Gender was significantly associated with both SBP and DBP, with women showing slightly lower values. This aligns with known gender differences in BP, especially before menopause. Age had a moderate positive correlation with systolic BP and BMI, confirming the expected trend of increasing BP and body weight with age. Interestingly, age was negatively associated with salt consumption behaviour, indicating poorer dietary habits among older adults.

Education showed a negative correlation with SBP, BMI, and salt consumption behaviour, suggesting that individuals with higher education may practice better health

behaviours and maintain better health outcomes. This supports the need for educational interventions to promote healthy living.

Salt consumption behaviour was positively correlated with BMI ($r = 0.1$, $p = 0.0$), indicating that individuals with higher BMI may engage in poorer salt-related dietary habits likely contributing to elevated health risks.

Conclusion

In alignment with the study's objective to determine the relationship between health status and salt consumption behaviour among VHVs in Siracha, Chonburi, the findings clearly demonstrate significant associations between salt intake behaviour and key health indicators including BMI, blood pressure, age, and education level. These results suggest that VHVs with poorer salt consumption practices tend to have higher BMI and blood pressure, particularly among older and less educated individuals, highlighting the need for targeted interventions to improve both health behaviours and outcomes in this population.

Recommendations

Based on the findings of this study on the health status and salt consumption behaviour among Village Health Volunteers (VHVs), the following recommendations are proposed to improve both individual and community health outcomes:

1. **Strengthening Health Promotion and Education** (Srisawat, et al., 2022) **for VHVs**

VHVs should be the primary target of comprehensive health education programmes focusing on non-communicable disease (NCD) prevention, particularly regarding: salt reduction strategies, healthy dietary habits, weight management, and blood pressure monitoring and control. This will not only improve their own health but also enhance their credibility and effectiveness in promoting healthy behaviours within their communities.

2. **Develop Tailored Nutrition Interventions**

Customised educational campaigns and tools should be designed to improve salt consumption behaviour, especially for older adults (50 years and above), individuals with lower educational backgrounds, and those with higher BMI or existing hypertension. Interventions should include practical, culturally appropriate messages and demonstrations (e.g., reading food labels, cooking with less salt, using herbs/spices instead of seasoning powders).

3. **Promote Regular Health Screening**

Routine monitoring of blood pressure, weight, and BMI should be institutionalised for all VHVs, including annual health check-ups, self-monitoring kits for home use, digital tracking platforms to log and review health metrics over time, etc. This helps in early detection and management of hypertension and obesity, encouraging proactive health behaviour.

4. **Integrate Salt Reduction Modules into VHV Training**

Salt consumption behaviour should be integrated into official VHV training modules. Topics should include effects of high salt intake, recommended daily salt limits, identifying hidden salt in processed foods, behavioural change techniques for themselves and the communities they serve.

5. **Encourage Peer Support and Healthy Role Modeling**

Establish peer-support groups among VHVs to share experiences, challenges, and solutions related to maintaining healthy lifestyles. VHVs should be encouraged to act as role models by adopting and showcasing positive health behaviours.

6. **Collaborate with local health authorities and community leaders**

Provincial and district health offices should collaborate with local leaders to support ongoing educational activities, mobile health clinics, and awareness campaigns on salt reduction and hypertension prevention at the village level.

7. **Conduct Further Research**

Additional studies should explore barriers to healthy salt consumption among VHVs, longitudinal changes in BP and BMI with interventions, the effectiveness of behaviour change communication tools targeting VHVs, etc. This evidence will guide future programme development and ensure interventions are evidence-based and context-specific.

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