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Health Literacy and Health Behaviors among Educational Supportive Staff in a Public University in Bangkok, Thailand: A Cross-Sectional Study

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Background and Objectives: Non-communicable diseases (NCDs) represent a significant public health challenge among the working-age population, where enhancing health literacy and healthy behaviors is essential to mitigate chronic disease risks.

Materials and Methods: This cross-sectional descriptive study aimed to assess health literacy, health behaviors, and the factors associated with health behaviors among 304 educational supportive staff at Ramkhamhaeng University. Participants were selected using stratified random sampling, and data were collected via questionnaires from December 2025 to January 2026. Data analysis was performed using descriptive statistics, Chi-square tests, and multivariable logistic regression analysis.

Results: The results showed moderate levels of health literacy (66.56%) and health behaviors (70.73%) among 304 participants. The multivariable logistic regression analysis identified two independent positive predictors of favorable health behaviors: the health communication domain (AOR = 2.13, 95% CI: 1.49–3.06, $p < 0.001$) and the self-management domain (AOR = 1.35, 95% CI: 1.09–1.68, $p = 0.006$). Conversely, the decision-making skills domain was found to be a significant negative predictor (AOR = 0.63, 95% CI: 0.50–0.78, $p < 0.001$). The final model accounted for 38.6% of the variance in health behaviors with 85.0% predictive accuracy.

Conclusion: These findings suggest that the university should strengthen health communication skills, empower departmental leaders, and address workplace barriers to sustainably enhance staff health behaviors.

Keyword: Educational Supportive Staff, Health Behaviors, Health Literacy, University Personnel

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Introduction

Non-communicable diseases (NCDs) have emerged as the preeminent global health crisis of the 21st century. In 2022, NCDs were responsible for approximately 74% of all deaths worldwide, with these fatalities also occurring in low- and middle-income countries (1). In the Thai context, this burden is particularly alarming; NCDs account for 77% of all deaths in the country, claiming nearly 390,000 lives annually (1). Furthermore, the prevalence of key metabolic risk factors in Thailand continues to escalate, with diabetes prevalence rising to 9.5% and hypertension reaching 25.4% (2). Despite national efforts, these rising statistics reflect an urgent need to address modifiable behavioral risks within the Thai population. Therefore, investigating health behaviors in this specific setting is critical to developing contextually appropriate interventions to mitigate the long-term impact of NCDs on the nation's public health system.

While global trends indicate a decline in premature mortality attributed to non-communicable diseases (NCDs), the working-age population continues to face high risks, particularly in low- and middle-income countries (3). In Thailand, the national health examination survey (2) shows that the prevalence of obesity has risen steadily, particularly among working-age women and men, reaching 46.4% and 37.8%, respectively. Simultaneously, the prevalence of diabetes and hypertension (25.4%) has demonstrated an upward trajectory associated with advancing age. A particularly concerning issue is the lack of awareness regarding these conditions; findings indicate that over 57.0% of working-age men with hypertension had not been previously diagnosed, and 30.6% of those with diabetes were unaware of their status.

Evidence regarding Thai supportive staff highlights critical health risks, including high BMI (61.54%) and hypertension (48.72%), alongside suboptimal dietary control (38.46%) and physical activity (33.33%) (4-5). These alarming metabolic and behavioral risks serve as direct, modifiable precursors to chronic conditions, making it harder for staff to protect themselves from long-term NCD risks (1). Psychosocial factors, particularly self-efficacy and health literacy, significantly drive these behaviors (6). Recent 2024 studies confirm that health literacy and self-management among university and urban health personnel remain at moderate levels, significantly correlating with risk prevention (7-8). However, barriers such as poor information access and limited media literacy continue to impede effective self-management (9), thereby increasing their long-term risk of developing NCDs.

Despite these findings, research gaps persist. Most studies focus broadly on university personnel, neglecting the unique occupational challenges of supportive staff (5). While gender and education influence health outcomes (10-11), recent data reveal inconsistent relationships; specifically, information access predicts positive behavior, whereas health-related decision-making shows low or negative correlations (7-8). Furthermore, evidence is lacking on how demographic diversity—such as age and experience—interacts with Nutbeam's health literacy levels within large-scale administrative settings (6, 12). Crucially,

there is a distinct shortage of empirical evidence exploring how these multi-level health literacy dimensions collectively operate as cognitive and social assets to reduce behavioral NCD risks in this specific sedentary workforce (5-6). Addressing this is vital for tailoring NCD-targeted, literacy-sensitive interventions to this sedentary workforce.

Consequently, this study explores Nutbeam's (13-14) health literacy framework—including functional, interactive, and critical levels—and its impact on the health behaviors of supportive staff at Ramkhamhaeng University, Bangkok, Thailand. As a major public institution in Bangkok, its large and diverse administrative workforce operates within a high-pressure urban environment, making it an essential setting for investigating health disparities. To address institutional diversity, the supportive staff is categorized into subgroups based on formal personnel types and position levels. These occupational classifications are entered into the multivariable logistic regression analysis as covariates, thereby statistically controlling for potential confounders and isolating the independent effects of health literacy dimensions among this predominantly office-based workforce. This study examines how health literacy influences the reduction of NCD-related behavioral risks among staff, specifically focusing on dietary habits, stress management, physical exercise, tobacco use, and alcohol consumption. The findings aim to establish targeted health promotion guidelines to enhance holistic well-being and readiness for duty. By modifying these lifestyles, this research ultimately seeks to mitigate the long-term prevalence and economic burdens of Non-Communicable Diseases (NCDs), fostering a healthier workforce capable of maintaining a high quality of life within society.

Materials and Methods

Type of Study, setting and participants

This cross-sectional descriptive study focused on educational supportive staff at Ramkhamhaeng University, with data collection conducted from December 2025 to January 2026. The inclusion criteria required participants to be currently employed as supportive staff, provide voluntary informed consent, and possess full mental capacity with proficiency in reading and writing Thai. Conversely, individuals were excluded if they had acute illnesses preventing questionnaire completion during data collection or significant sensory impairments, such as severe hearing or visual loss. The study also established termination criteria in the event of unforeseen physical or psychological risks to participants or an exceptionally high withdrawal rate that could compromise the study's viability.

Sample size and Sampling Technique

The sample size was calculated based on a total population of 2,520 individuals (15). The target proportion (p) was set at 0.72, derived from a previous study on the health behaviors of supportive staff by Wongsawat and Phichaipaet (11). The initial requirement of 276 was increased by 10% to account for data loss, resulting in a final sample of 304 participants. This size was sufficient for binary logistic regression, meeting the Events Per Variable (EPV) criterion of at least 10 events per independent variable (16) for the 13–15 predictors

analyzed. A stratified random sampling technique was employed, with the sample size for each personnel category determined using probability proportional to size (PPS) (17). Within each stratum, participants were selected through systematic random sampling.

Research instruments and data collection

The research instrument employed in this study was a structured questionnaire, which consisted of three primary sections:

1. Personal Factors

This section comprised 12 items designed to collect socio-demographic and occupational data, including gender, age (year), educational level, affiliated department, job position, personnel category, monthly income (Thai Baht), marital status, underlying medical conditions, work tenure (year), residential characteristics, and primary health communication channels. The items were formulated using both closed-ended and open-ended questions.

2. Health Literacy

The health literacy (HL) instrument was adapted from the modernized framework for Thai working-age groups (15-59 years) by Intarakamhang (18), which expands Nutbeam's (13) original three progressive levels into six sub-dimensions by integrating health behaviors (Eating, Exercise, Emotion, Smoking cessation, and Substance/Alcohol reduction) into the items. The tool comprises three levels and six sub-dimensions:

Level 1: Functional health literacy — refers to the basic skills in reading and writing to function effectively in everyday health situations.

1) Health knowledge and understanding (6 items): Evaluated using a 4-option multiple-choice format to assess fundamental knowledge of health principles and risk factors. Scores range from 0 to 6.

Level 2: Interactive health literacy — refers to more advanced cognitive and literacy skills that can be used to actively participate in health activities and apply new information to changing circumstances.

2) Access to health information and Services (2 items): Measured using a 5-point Likert scale (1=never to 5=always), this subscale assesses the ability to search for and verify health information from reliable sources. The total score for this section ranges from 2 to 10, with higher scores indicating greater proficiency in information access.

3) Health communication (3 items): Measured using a 5-point Likert scale (1=never to 5=always), this subscale assesses the ability to interpret and exchange health information with others. For negative items, reverse scoring was applied (5=always to 1=never) to ensure consistency in interpretation. The aggregate scores for this dimension range from 3 to 15, with higher scores indicating better communication skills.

4) Decision-making skills (3 items): Evaluated using situational scenarios with a 4-option multiple-choice format. Unlike conventional multiple-choice questions, each option is weighted based on the appropriateness of the health action under social pressure, with

scores ranging from 1 to 4 per item. The aggregate scores for this dimension range from 3 to 12, where higher scores reflect superior decision-making abilities in complex social contexts.
Level 3: Critical health literacy — refers to the most advanced cognitive skills which can be applied to critically analyze information and exert greater control over life events and situations.

5) Self-management (3 items): Measured using a 5-point Likert scale (1 = never to 5 = always), this subscale assesses the practical application of health principles (3E 2S) to control and improve health status. The aggregate scores for this dimension range from 3 to 15, with higher scores indicating superior self-management proficiency.

6) Media and information literacy (2 items): Measured using a 5-point Likert scale (1 = never to 5 = always), this subscale evaluates the ability to critically analyze health-related media and weigh potential benefits and drawbacks before making health commitments. The aggregate scores for this dimension range from 2 to 10, with higher scores indicating superior media and information literacy.

The scoring and interpretation were adapted from the framework by Intarakamhang (18). For each sub-dimension, scores were categorized into three levels based on specific cut-off points. Health literacy dimensions (1, 1.2–1.6) and overall health behaviors are categorized by levels (Low, Moderate, and High), whereas the Health Knowledge and Understanding dimension (1.1) is categorized by accuracy (Incorrect, Partially Correct, and Highly Accurate). Furthermore, the overall health literacy score (ranging from 13 to 68) was interpreted into three proficiency levels: poor (< 40.80), representing inadequate literacy for health practices; moderate (40.80 – 54.39), indicating sufficient literacy with occasional correct practices; and excellent (54.40 – 68.00), reflecting highly sufficient literacy with consistent and proficient health practices.

3. Health Behaviors

This section comprised 25 items designed to assess health-related practices across five key dimensions: dietary habits (11 items: 6 positive and 5 negative statements), stress management (8 items: 3 positive and 5 negative statements), physical exercise (2 positive items), tobacco use or exposure (3 negative items), and alcohol consumption (1 negative item). The items utilized a 5-point Likert scale to measure frequency of practice, ranging from "always" to "never." Negative statements were reverse-scored accordingly. The total mean scores were interpreted into three levels based on the criteria established by Best (19): Low (1.00 – 2.33), Moderate (2.34 – 3.67), and High (3.68 – 5.00).

The questionnaire was validated by experts using the Index of Item Objective Congruence (IOC) (20), with acceptable values ranging from 0.67 to 1.00. Revisions were made in response to the experts' feedback. To ensure that these adapted items were fully appropriate for the specific occupational environment of university supportive staff, a pilot test was conducted with 30 supportive staff members at Mahidol University, whose characteristics were similar to the target sample. For the health knowledge and understanding dimension (dichotomous scale), internal consistency was assessed using the Kuder-Richardson Formula 20 (KR-20) (21),

yielding a value of 0.70. For the remaining five dimensions of health literacy, internal consistency was evaluated collectively, yielding an overall Cronbach's alpha coefficient of 0.83. For the health behaviors section, the Cronbach's alpha coefficient was 0.75.

Data collection was conducted after obtaining institutional permission. The researcher coordinated with department heads to access the target sample and held brief informational sessions to explain the study's protocol. Eligible participants were provided with information sheets and a 2–3 days consideration period. Upon voluntary agreement, structured questionnaires were distributed and collected in private settings to ensure confidentiality. To eliminate potential bias or coercion, department heads only facilitated initial access and had no administrative involvement in the recruitment process, which further encouraged genuine and widespread voluntary participation.

Statistical analysis

Data were analyzed using descriptive and inferential statistics. Socio-demographic characteristics, health literacy, and health behaviors were summarized using frequencies and percentages. Continuous variables were first tested for normality using the Kolmogorov-Smirnov test. Since the data were found to be non-normally distributed, continuous variables including, total scores of health literacy and health behaviors were expressed as median and interquartile range (IQR). However, age, income, duration of work, and individual items of health literacy and health behaviors were described using mean and standard deviation (SD). The factor selection process followed a two-stage approach. First, relationships between personal factors, health literacy, and health behaviors were examined using Spearman's rank correlation and Chi-square tests. Variables demonstrating a p-value < 0.25 from these bivariate tests were then entered into the univariable logistic regression. Subsequently, variables that remained significant at $p < 0.25$ in the univariable analysis were included in the multivariable logistic regression model using the Enter method to determine their independent influence. For the Chi-square tests and binary logistic regression, the health behavior outcome was dichotomized into two groups: participants with 'Low' and 'Moderate' scores were combined into a single reference group, while those with 'High' scores served as the outcome group. In addition, prior to executing the multivariable logistic regression analysis, multicollinearity among the independent variables and covariates was assessed using the Variance Inflation Factor (VIF), with a VIF value of<5.0 considered acceptable to indicate the absence of significant multicollinearity. Statistical significance for the final model was set at $p<0.05$. All calculations were performed using the Statistical Package for the Social Sciences (SPSS) version 25.

Results

A total of 304 questionnaires were distributed, and all 304 completed questionnaires were returned and included in the analysis (response rate=100.0%). A slight majority of the participants were female (50.70%). The average age was 42.03 years (SD=9.25; median=43.00, IQR = 35.00–50.00), with the largest group aged 40–49 years (37.83%). Most participants held a post-graduate degree (47.00%), followed by a bachelor's degree (43.10%).

Regarding occupational profiles, the majority were affiliated with university support office (45.07%), held operational-level positions (51.32%), and were university employees (61.51%). The mean monthly income was 30,152.67 THB (SD=15,382.77; median=26,000.00, IQR=21,537.50–35,250.00). More than half were single (56.25%). Although 68.40% reported no underlying medical conditions, hyperlipidemia (15.50%) and hypertension (14.47%) were the most prevalent chronic diseases among those affected. The average work tenure was 13.50 years (SD = 9.68; median = 13.00, IQR = 4.00–20.00), with 31.91% having over 20 years of experience. Most resided in apartments or condominiums (47.70%). Regarding health communication, 87.50% had received health information within the past month, primarily through social media platforms such as Line, Facebook, and TikTok (72.70%).

Health literacy

The overall health literacy of the participants was primarily at a moderate level (66.56%), followed by high (21.74%) and low (11.71%) levels. The average score was 48.57 (SD=7.08) out of 68, with a median of 49.0 (IQR: 10.0). Analysis of specific dimensions, as illustrated in Figure 1, revealed varying levels of proficiency across the six domains:

Health knowledge and understanding yielded an average score of 3.95 ± 1.23 (Median=4.0, IQR = 2.0). Notably, while 38.49% of participants achieved highly accurate scores, a significant portion (31.25%) provided incorrect responses. Access to health information and services was a strong dimension, with over 60% of participants reaching a high level (Median=8.0, IQR=3.0). Similarly, media and information literacy showed the highest proficiency, with a majority of staff (70.72%) at a high level (Median=8.0, IQR=3.0).

In contrast, health communication emerged as the weakest area; more than 60% of participants fell into the low category (Median=9.0, IQR=2.0). For decision-making, 43.00% achieved a high level (Median=9.0, IQR=2.0), while self-management scores showed that 44.22% of participants reached the high-level proficiency (Median=11.0, IQR=3.0).

Health behaviors

Overall health behaviors among the participants were predominantly at a moderate level (70.73%), with an average score of 2.02 (SD=0.66), with a median of 1.94 (IQR:0.84) out of a total score of 4.00 **(Figure 1).** When examining specific dimensions, dietary habits showed the highest scores in daily water intake (at least 8 glasses) and maintaining three regular meals per day. However, less favorable behaviors were observed regarding the consumption of undercooked food, high-sodium products, and fast food. In terms of stress management, while many participants successfully engaged in stress-relieving activities 2.73 (SD=1.18) out of 4, a significant portion reported experiencing severe irritability and stress-related psychological symptoms. Regarding physical activity, participants were more likely to engage in movement through daily routines rather than dedicated exercise sessions. Furthermore, behaviors related to tobacco and alcohol consumption remained at a moderate level, with secondary exposure to secondhand smoke in public areas being more prevalent than active smoking.

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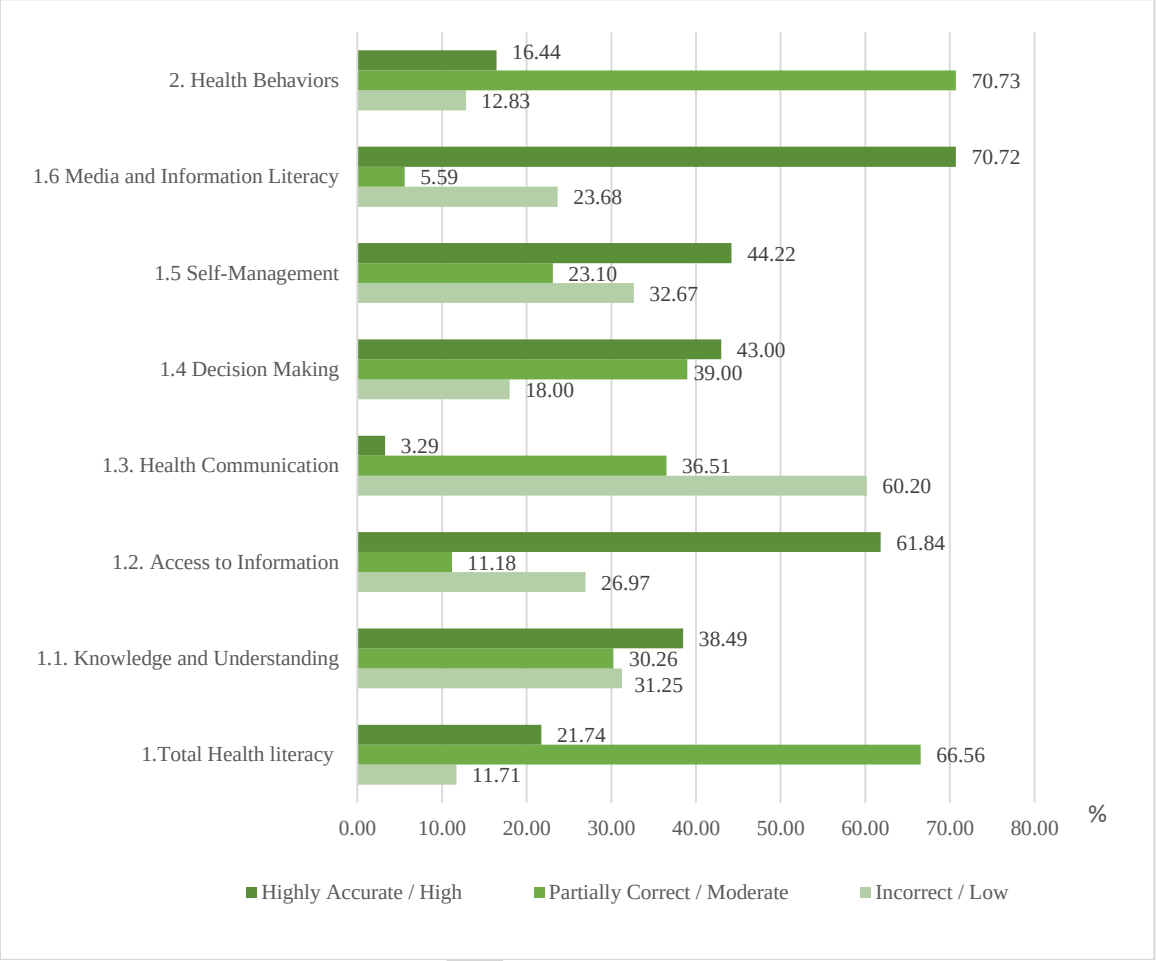

Figure 1- Percentage distribution of health literacy levels (knowledge accuracy) and health behaviors (practice frequency) among participants, N = 304

Note: Health literacy dimensions (1, 1.2–1.6) and overall health behaviors are categorized by levels (Low, Moderate, and High), whereas the Health Knowledge and Understanding dimension (1.1) is categorized by accuracy (Incorrect, Partially Correct, and Highly Accurate).

Factors Associated with Health Behaviors

Based on the Chi-square analysis in **Table 1**, education level (χ^2=9.902, p=0.002) and job position (χ^2 =8.560, p=0.014) were significantly associated with health behaviors. Participants with a Bachelor's degree or higher and those in professional staff positions tended to report different levels of health practices compared to their counterparts. However, other personal factors, including gender, marital status, underlying diseases, type of residence, affiliation, personnel type, and health information exposure, showed no significant associations with health behaviors (p>0.05).

Table 1- Association of sociodemographic parameters and health behaviors among educational supportive staff, N=304

Variable	Health behaviors n(%)		χ^2	p-value*
	Low -Moderate	High		
Total	254(83.6)	50(16.4)		

Sex				
Male	123(82.0)	27(18.0)	0.519	0.471
Female	131(85.1)	23(14.9)		
Education level				
<Bachelor's Degree	19(63.3)	11(36.7)	9.902	0.002
≥ Bachelor's Degree	235(82.8)	39(14.2)		
Marital Status				
Single	143(83.6)	28(16.4)	1.302	0.522
Widowed / Divorced / Separated	23(76.7)	7(23.3)		
Married	88(85.4)	15(14.6)		
Underlying Disease				
None	174(83.7)	34(16.3)	0.005	0.944
Yes	80(83.3)	16(16.7)		
Type of Residence				
Dormitory / Apartment / Condominium	119(82.1)	26(17.9)	2.524	0.283
Townhouse	36(78.3)	10(21.7)		
Twin House / Single-Detached House	99(87.6)	14(12.4)		
Affiliation				
Faculty	73(83.0)	15(17.0)	0.720	0.869
Office of the President	43(81.1)	10(18.9)		
Institute / Center Regional Campus in Honour of His Majesty the King	23(88.5)	3(11.5)		
University Support Office	115(83.9)	22(16.1)		
Job Position				
Employee	29(72.5)	11(27.5)	8.560	0.014
Operational Staff	36(75.0)	12(25.0)		
Professional Staff	189(87.5)	27(12.5)		
Personnel Type				
Civil Servant	15(78.9)	4(21.1)	4.638	0.098
University Employee	163(87.2)	24(12.8)		
Temporary Staff	76(77.6)	22(22.4)		
Health Information Exposure in the past month				
No exposure	34(89.5)	4(10.5)	1.108	0.293
Exposed	220(82.7)	46(17.3)		

*p-value<0.05 was considered statistically significant

As shown in **Table 2**, Spearman's correlation analysis identified significant negative correlations between health behaviors and three sociodemographic parameters: duration of work: (r_s=-0.200, p<0.001), age: (r_s=-0.183, p=0.001), and average monthly income (r_s=-0.154, p=0.008). For health literacy, overall health literacy showed a significant positive correlation with health behaviors (r_s=0.270, p<0.001). When examining individual dimensions, four out of six dimensions demonstrated significant positive correlations: Health communication showed the strongest correlation (r_s=0.436, p<0.001). Followed by self-management (r_s=0.391, p<0.001), media and information literacy (r_s=0.204, p<0.001). and access to health information and services (r_s=0.186, p=0.001), respectively. Notably, health knowledge and

understanding (p=0.079) and decision making for practice (p=0.078) did not show statistically significant correlations with health behaviors in this analysis.

Table 2- Association of sociodemographic parameters, Health literacy, and health behaviors among educational supportive staff, N=304

Variable	Health behaviors	
	r_s	p-value*
Sociodemographic parameters		
Age (years)	-0.183	0.001
Average monthly income (THB)	-0.154	0.008
Duration of work (years)	-0.200	<0.001
Health literacy	0.270	<0.001
Health knowledge and understanding	-0.101	0.079
Access to health information and services	0.186	0.001
Health communication	0.436	<0.001
Decision making for practice	-0.102	0.078
Self-management	0.391	<0.001
Media and information literacy	0.204	<0.001

*p-value<0.05 was considered statistically significant
r_s = Correlation Coefficient of Spearman's Rho
THB = Thai Baht

The results of the univariable and multivariable logistic regression analyses are presented in **Table 3.** The final multivariable model demonstrated a good fit, with a Nagelkerke R^2 of 0.386, indicating that the independent variables in the model could account for 38.6% of the variance in health behaviors among the participants. The model also achieved a high overall predictive accuracy of 85.0%.

For sociodemographic factors, the univariate analysis showed that job position and average monthly income were significantly associated with health behaviors. Specifically, employees (OR=2.66, 95% CI: 1.19–5.93, p=0.017) and operational staff (OR=2.33, 95% CI: 1.08–5.03, p=0.031) showed higher odds of positive health behaviors compared to professional staff. Additionally, each 1,000 THB increase in income was associated with a 3% decrease in the likelihood of exhibiting desirable health behaviors (OR=0.97, 95% CI:0.94–1.00, p=0.047). However, when adjusting for all variables in the multivariable model, none of the sociodemographic parameters remained statistically significant predictors (p>0.05). Notably, while education level showed a significant global association in the initial bivariate analysis (Table 1), its sub-category did not reach statistical significance in the univariable logistic regression due to the unequal distribution of the sample across sub-categories.

For health literacy factors, the multivariable analysis revealed three independent predictors of health behaviors within the health literacy dimensions:

1) Health Communication: This factor emerged as the strongest positive predictor. For every one-unit increase in the health communication score, the odds of exhibiting desirable health behaviors increased significantly by 2.13 times (AOR=2.13, 95% CI: 1.49–3.06, p<0.001).

2) Self-management: Increased self-management scores were positively associated with better health behaviors, with a 1.35-fold increase in the odds per unit increase (AOR=1.35, 95% CI:1.09–1.68, p=0.006).

3) Decision Making for Practice: Conversely, this dimension showed a significant inverse relationship, where higher scores were associated with a lower likelihood of positive health behaviors (AOR=0.63, 95% CI:0.50–0.78, p<0.001). Although this negative association is unexpected, it is related to tool limitations and should be interpreted with caution, as explained in detail in the discussion section.

In addition, the multivariable logistic regression showed no multicollinearity concerns. The Variance Inflation Factor (VIF) values ranged from 1.147 to 2.972.

Table 3- Univariable and multivariable logistic regression analysis of factors associated with health behaviors among educational supportive staff, N=304

Variable	Univariable logistic regression		Multivariable logistic regression	
	OR (95% CI)	p-value*	OR (95% CI)	p-value*
Sociodemographic parameters				
Education level				
<Bachelor's Degree	1.25(0.68-2.30)	0.472	-	-
≥Bachelor's Degree	Ref			
Job Position				
Employee	2.66(1.19-5.93)	0.017	0.22(0.04-1.15)	0.072
Operational Staff	2.33(1.08-5.03)	0.031	0.54(0.09-3.40)	0.513
Professional Staff	Ref		Ref	
Personnel Type				
Civil Servant	Ref			
University Employee	0.55(0.17-1.80)	0.325	-	-
Temporary Staff	1.09(0.33-3.61)	0.893	-	-
Age (per 1-year increase)	0.98(0.95-1.01)	0.170	1.01(0.95-1.08)	0.710
Average monthly income (per 1,000 THB increase)	0.97(0.94-1.00)	0.047	0.97(0.91-1.02)	0.211
Duration of work (per 1-year increase)	0.98(0.94-1.01)	0.143	1.00(0.93-1.07)	0.955
Health literacy				
Health knowledge and understanding	0.70(0.56-0.89)	0.004	0.74(0.53-1.04)	0.081
Access to health information and services	1.24(1.02-1.50)	0.028	0.90(0.66-1.21)	0.474
Health communication	1.93(1.50-2.49)	<0.001	2.13(1.49-3.06)	<0.001
Decision making for practice	0.75(0.64-0.88)	<0.001	0.63(0.50-0.78)	<0.001
Self-management	1.38(1.19-1.60)	<0.001	1.35(1.09-1.68)	0.006
Media and information literacy	1.06(0.90-1.26)	0.482	-	-

Note: Only variables with *p*-value < 0.25 in univariate analysis were entered into the multivariable analysis.

*p-value<0.05 was considered statistically significant

OR = Odds Ratio; CI = Confidence Interval; THB = Thai Baht; Ref = Reference group.

Multicollinearity was tested for all predictors; Variance Inflation Factor (VIF) values ranged from 1.147 to 2.972, indicating no multicollinearity concerns.

Discussion

The overall health literacy (HL) of university supportive staff was moderate (66.56%), revealing a significant gap between high information access and low health communication. This disparity likely stems from the university environment, where high digital literacy provides easy access to data but does not necessarily foster interpersonal communication skills. These findings align with trends observed among educational staff both in Thailand (6, 8) and internationally (12, 22-23), where a substantial proportion of personnel exhibit limited or inadequate health literacy despite working in a professional academic setting. Furthermore, this is consistent with evidence from organization-based professionals, which demonstrates that while digital information access is highly prevalent in workplace settings, it does not automatically ensure sufficient competencies in the interactive and communicative dimensions of health literacy among personnel (24).

The low health communication scores among staff can be explained through Nutbeam's (13) framework. Most participants functioned predominantly at the 'Functional' HL level, meaning they can read and comprehend basic health information but lack 'Interactive' skills. Consequently, despite being adept at sourcing health facts, staff may lack the confidence to engage in health-focused dialogues or ask questions during healthcare encounters. The emergence of health communication as the weakest dimension is partly attributable to the rigid 60% cut-off threshold derived from Intarakamhang (18). Conceptually, this low scoring also reflects the workplace environment of university supportive staff, where interpersonal interactions are predominantly occupied by professional duties rather than health-related discussions. This communication gap is supported by Kongrueang et al. (9), who reported poor health communication skills among Thai teachers. Similarly, Marinucci et al. (25) and Oxendine (26) noted that institutional staff often feel under-trained to discuss health topics effectively. Therefore, while information acquisition is effortless within a university, a clear need exists for targeted programs to enhance staff interpersonal and health communication skills.

Regarding health behaviors, the participants' scores were predominantly moderate (70.73%). While basic dietary hygiene was acceptable, specific dietary choices and physical activity were heavily constrained by time limitations and the urban environment, consistent with findings by Constantinides et al. (27) and Utthiya et al. (5) regarding office workers. Additionally, prevalent stress symptoms suggest personal coping challenges within demanding work contexts, aligning with Demerouti's (28) Job Demands-Resources (JD-R) model, which emphasizes the critical balance between occupational demands and personal resources.

Spearman's correlation analysis indicated that overall health literacy was positively correlated with health behaviors. This finding supports Nutbeam's (13) proposition that health literacy is more than a set of functional skills; it is a critical tool for empowerment that enhances an

individual's confidence and ability to apply health information, make informed decisions, and exert greater control over health outcomes. This is consistent with Amoah et al. (23), who identified health literacy as a pivotal driver encouraging school personnel to adopt protective health behaviors. Similarly, Kinoshita et al. (12) demonstrated that higher health literacy significantly associates with healthier lifestyle choices, particularly regarding dietary habits and regular exercise among organization-based populations.

Multivariable logistic regression further identified health communication as the strongest independent factor associated with positive health behaviors (AOR = 2.13). According to Nutbeam's (13) theory, this indicates that personnel who progress beyond Functional HL to the Interactive HL level can effectively extract, process, and apply information across diverse communication channels. These superior interactive skills foster the confidence required to clarify health advice with experts, thereby translating latent 'knowledge' into real-world 'action.' This finding is corroborated by Kinoshita et al. (12) and Luo et al. (30), who confirmed that enhanced communication and health literacy dimensions are significantly associated with positive health behaviors. Furthermore, Rodratn et al. (31) indicated that communication skills are crucial for filtering health information within high-pressure work contexts. This is also supported by Demerouti (28) and Amoah et al. (23), who view health literacy—particularly communication—as a vital Personal Resource. When personnel possess effective interactive and analytical skills, work-related stress is mitigated, and health-protective behaviors are enhanced during crises.

Similarly, self-management health literacy emerged as a significant factor associated with positive health behaviors (AOR = 1.35). Staff with sufficient self-management skills were 1.35 times more likely to practice appropriate health behaviors than those with insufficient skills. This echoes previous studies among supportive staff and corporate organizations (7-8, 32), indicating that proactive self-management and health regulation are primary drivers of behavioral execution, rather than information access alone; conversely, a deficiency in these skills often precipitates poor overall health behaviors (9). These findings suggest that personnel who can effectively manage job demands are better equipped to control their health behaviors. This aligns with Demerouti (28), who emphasizes that utilizing personal resources and job crafting are essential mechanisms for coping with high workloads while maintaining personal well-being.

Interestingly, scenario-based decision-making skills displayed an inverse relationship with health behaviors (AOR = 0.63), shifting from a non-significant bivariate correlation (p = 0.078) to a significant negative factor in the final multivariable model. Methodologically, this phenomenon indicates a "negative suppression effect" (32), where robust predictors like health communication and self-management acted as suppressors, stripping away shared variance and revealing the unique, negative residual association of decision-making with actual behaviors. Conceptually, this suggests that high cognitive competency in hypothetical health choices does not automatically translate into actual practice due to the "availability

heuristic" (33), where immediate professional deadlines override long-term wellness priorities. Furthermore, under the Theory of Planned Behavior (34), heavy workloads and institutional time constraints significantly diminish Perceived Behavioral Control, preventing staff from executing their decisions. This is consistent with Rababah et al. (35), who noted that professional or academic status does not guarantee better health when temporal barriers override individual health logic. Additionally, the scenario-based tool had a limited number of items and might not fully capture complex cognitive processes or real-world behavioral triggers. Therefore, this negative association should be interpreted with caution; it does not imply that better decision-making skills worsen health behaviors, but rather reflects how measurement limitations and workplace demands obstruct the translation of intent into practice.

Regarding sociodemographic factors, variables such as age, income, and education level displayed significant associations in the initial bivariate analysis but lost statistical significance in the final multivariable logistic regression model. This attenuation is common when controlling for confounding factors collectively. It implies that when accounting for internal cognitive and behavioral competencies, demographic backgrounds and socioeconomic constraints become less critical. Ultimately, specific behavioral skills—such as health communication, self-management, and decision-making—exert a more prominent and direct influence on shaping staff health behaviors than socioeconomic backgrounds (30).

Based on these findings, universities should transition from passive information sharing to 'Interactive Health Literacy Workshops' that actively strengthen communication and self-management skills. Institutional environments should also be restructured by providing healthier dietary options during meetings and creating accessible exercise spaces to mitigate the physical barriers identified in this study. Ultimately, empowering departmental leaders and addressing workload constraints are essential to making healthy practices both feasible and sustainable for supportive staff.

A major strength of this study is its focus on university supportive staff, a group often overlooked in academic health research. However, this study has some limitations. First, the cross-sectional design limits the ability to establish causality between health literacy and behaviors. Second, the reliance on self-reported data may lead to social desirability bias, where participants might overestimate their healthy practices. Third, the findings are based on a single university in an urban setting (Bangkok), which may limit the generalizability of the results to staff in different geographical or organizational contexts. Lastly, while the health literacy tool used is validated, it measures perceived ability rather than actual performance in real-world health situations.

Conclusion

The supportive staff exhibits moderate levels of both health literacy and health behaviors. Despite having high information access, their health communication skills remain low,

creating a significant gap in active health engagement. Multivariable analysis demonstrates that health literacy—particularly health communication and self-management—serves as a primary factor associated with positive health behaviors, whereas high cognitive decision-making skills do not necessarily translate into actual practice. This disconnect highlights that having decision-making skills alone is insufficient to guarantee behavioral change without proficient communication and self-management capabilities. Therefore, university health programs should transition from passive information sharing to prioritizing the enhancement of interactive communication and practical self-management skills to effectively and sustainably support employee well-being.

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