The Journal of Behavioral Science
2025, Vol. 20, Issue 1, 47–60

ISSN: 1906-4675 (Print), 2651-2246 (Online)

The Journal of Behavioral Science (TJBS)

Quantitative Research Article

Health Literacy and Health Behaviors of University Staff in Thailand: A Causal Mediation Analysis

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Abstract

Background/problem: Health literacy and adopting healthy behaviors are essential components for university staff to sustain their well-being, improve productivity, avert illness, and cultivate a supportive, health-oriented workplace atmosphere.
Objective/purpose: This study seeks to investigate the causal determinants influencing the health literacy and health behavior of staff at universities in Thailand.
Design and Methodology: Cluster sampling was employed, using a quantitative research design, involving 320 university personnel in Thailand. The research tools used were questionnaires. Data analysis was carried out using descriptive statistics and component-based structural equation modeling.
Results: Results of the study demonstrated that 1) health empowerment positively effects both health literacy (β = .60, p < .001) and health behavior (β = .39, p < .001); 2) social support has a positive effect on health literacy (β= .28, p < .001) and health behavior (β = .11, p = .04), and 3) health literacy positively effects on health behavior (β = .38, p < .001). The factor loadings of all observed variables were significantly different from zero at a statistical significance. Health empowerment and health literacy exhibit a statistically significant indirect effect on health behavior through health literacy (β = .23, p < .001), suggesting that health literacy serves as a partial mediator.
Conclusion and Implications: This study highlights the effect of health literacy on health behavior and finds that health empowerment is a crucial factor in promoting health behavior. Recommendations from this research suggest promoting health literacy and empowering university staff to effectively use health information to make informed decisions.

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Article Information

Received: 26.06.24
Revised: 04.09.24
Accepted for review: 06.09.24

Keywords

Health behavior, health empowerment, health literacy, social support, university staff.

Health behavior and health literacy are crucial in enhancing and perpetuating optimal health. This is because health behaviors encompass actions to preserve an individual's well-being. The nurturing of health in individuals is fostered by familial, communal, and societal efforts to align health practices with personal objectives, thereby establishing habitual patterns (World Health Organization, 2021). Health literacy entails the possession of knowledge, critical thinking abilities, and life skills, enabling individuals to pursue holistic well-being encompassing physical, mental, social, and intellectual dimensions, particularly in the realm of health promotion, disease prevention, hazard mitigation, and healthcare access (Nutbeam, 2008). Moreover, health empowerment is pivotal in influencing health behaviors, encompassing the mental, emotional, and physical capacity to act, as Shearer (2009) discussed. It enhances an individual's aptitude and potential to grasp the significance of healthcare and well-being. Therefore, Health literacy mediates

the relationship between social support and health-promoting behaviors, suggesting that enhanced literacy leads to healthier lifestyle choices (Zhang et al., 2024).

Promoting healthy behaviors and health literacy holds significant importance for individuals across various demographics, including those in the workforce who may face challenges of health behaviors. Specifically, university staff in Thailand, falling within the working-age bracket, are financially sustained by the university's budget and earnings from educational institutions. Although their performance evaluation standards may be more rigorous than civil servants' remuneration packages, benefits, and welfare schemes differ (Silpakorn University, 2017). This disparity in employment conditions necessitates university staff to enhance their work performance in response to the evolving landscape of higher education institutions, intensifying competition.

Consequently, prioritizing promoting healthy behaviors among this cohort becomes imperative, underscoring the critical need to maintain physical and mental well-being. Therefore, it becomes paramount for research endeavors to focus on advancing healthy behaviors within this demographic (Supriyati et al., 2021). Hence, equipped with health literacy, health empowerment, and social support, university staff can cultivate positive changes in health-promoting behaviors, ultimately enhancing work efficiency, job satisfaction, and overall quality of life. Academic staff in higher education institutions, such as universities, are most affected by health problems. Literature suggests that increasing workloads, poor work-life balance, lack of management support, and other factors contribute to workplace anxiety and stress, which impact their mental well-being. Previous research focusing on academic staff in higher education institutions has examined the role of health literacy and management support in influencing mental health (Ohadomere & Ogamba, 2021). Therefore, there are research gaps in studying the factors affecting the health behavior of university staff, including both direct and indirect effects, with health literacy acting as the mediator. This research aims to fill these gaps by contributing to behavioral science by applying the theory of planned behavior to understand the role of health literacy as a crucial mediator between health empowerment and social support for the health behaviors of university staff. The findings of this study are expected to facilitate the adoption of health-promoting behaviors among university staff.

Literature Review

The literature review delineates the pertinent theory of planned behavior, concept of health behavior, health literacy, health empowerment, and prior research supporting the relationships between the research variables and the research hypotheses.

Theory of Planned Behavior

The theory of planned behavior (TPB) is a psychological framework for predicting behavior and explaining the determinants of individual decision-making (Hagger & Hamilton, 2021). The primary purpose of TPB is to predict and clarify one's behavior and explain behavior based on one's intentions (Ajzen, 2012). This theory is an extended model of the theory of reasoned action, positing that an individual's behavioral intentions are shaped by their attitude towards the behavior and subjective norms, which represent perceived social influences to engage or abstain from certain behaviors (Ajzen, 2012), according to the TPB, an individual' s decision-making process is characterized by a rational evaluation of the potential outcomes of their actions. The intention to engage in a particular behavior signifies a cognitive readiness to act and serves as a primary precursor to the actual enactment (Liu et al., 2020). This construct is influenced by three independent constructs, attitude, subjective norm, and perceived behavioral control, that can explain people's intentions for their behavior. This theory has also been used successfully as a functional model for behavioral intention in health behaviors and health-related behavioral intentions (Hagger & Hamilton, 2021; Shamlou, 2021). Therefore, this study employs the TPB as a theoretical

framework to conduct the conceptual framework and examine the effect of social support, health empowerment, and health literacy on health behaviors (Ajzen, 2012).

Health Behavior

Pender et al. (2006) define health behavior as consistent engagement in health-promoting activities to maintain or enhance well-being and self-value. They emphasize health behaviors as efforts to achieve optimal outcomes for individuals, families, and communities through structured lifestyle management aligned with specific health objectives. Therefore, the TPB explains how individual attitudes, social influences, and perceived control over behavior predict health-related decisions and behaviors.

Individual health behaviors encompass five key elements: 1) health responsibility, which denotes an individual's conduct accountable for safeguarding their health and well-being (Pender et al., 2006); 2) nutrition, which entails the conscious selection of foods per the body's nutritional requirements to obtain all essential nutrients and promote nourishment (Pender et al., 2006); 3) physical activity, which involves movements of various body parts that consume energy, encompassing exercise and routine daily activities (Pender et al., 2006); 4) stress management, which include physical exercise, relaxation techniques, and cognitive reframing (Anderson et al., 2024); and 5) interpersonal relations, which encompass behaviors individuals demonstrate to showcase their skills and strategies in establishing connections with others (Pender et al., 2006).

Health Literacy

The World Health Organization (2021) defines health literacy as the cognitive and social abilities that influence an individual's motivation and capacity to access, comprehend, and utilize information in diverse manners to foster and sustain good health. Therefore, the TPB explains how health literacy plays a significant role in shaping behavioral intention, which is the immediate determinant of whether a person engages in a specific health behavior. The first aspect, known as access skill, involves the adept use of capabilities in selecting health-related resources and knowing how to source information regarding one's health practices from reliable outlets, including healthcare providers, through various channels. The second aspect, cognitive skill, pertains to knowledge that enables the correct understanding of health practices. Communication skill, the third aspect, involves proficiency in speaking, reading, and writing, and persuading others to understand and accept information regarding one's practices. Effective communication of health information is linked to health literacy, which encompasses accessing, understanding, and utilizing health-related information. Therefore, health literacy is essential for promoting health and enabling individuals to comprehend health information and engage in health-promoting behaviors (Caeiros et al., 2024). Self-management skill, the fourth aspect, refers to the ability to establish goals, devise and implement plans, and review progress towards achieving these goals to modify behaviors appropriately (Nutbeam, 2008). Decision skill, the fifth aspect, involves the ability to formulate choices, reject or avoid negative consequences, and select a course of action that aligns with the proper behavior. Lastly, media literacy skill, the sixth aspect, refers to the capability to critically evaluate the accuracy and reliability of information presented by the media, compare diverse media sources to mitigate potential risks to personal and public health, and assess media messages to guide communities and society (Nutbeam, 2008). Individuals with enhanced health literacy are adept at critically evaluating health information and making well-informed decisions concerning their health (Berkman et al., 2011).

Health Empowerment

Shearer (2009) defined, health empowerment involves the recognition of one's potential across mental capacities, emotions, and physical activities. He suggested that the elements of health empowerment encompass: 1) personal growth, denoting an individual's continual pursuit of self-enhancement characterized by receptiveness to new encounters and acknowledgment of both personal and communal

potential, 2) purpose of life pertains to an individual's sense of direction and meaningful goals, both past and present, thereby imbuing life with purpose, and 3) self-acceptance involves maintaining a positive self-regard, embracing various perspectives—positive and negative—and fostering affirmative sentiments towards past experiences. In addition, individuals tend to be more involved in behaviors that are easier to understand than behaviors that they think are difficult and have less control over. In general, the more positive and powerful the attitudes, subjective norms, and perceived behavioral control of individuals, the more likely it is that behavioral intention will be formed (Shamlou et al., 2022). Therefore, the TPB explains how empowerment enhances an individual's ability to form positive attitudes toward health behaviors.

Social Support

Social support corresponds to information and behaviors that make consumers feel loved, cared for, and valued (Nguyen et al., 2024) Social support encompasses different forms. Firstly, emotional support entails actions that foster a sense of comfort and affirmation of an individual's worth, demonstrating empathy and assurance. Secondly, information support involves the transmission of advice and feedback. Lastly, instrumental support involves receiving tangible aid and support from others (Thakur et al., 2020). Therefore, the TPB explains how social support reinforces norms by shaping normative beliefs and boosting compliance motivation, while augmenting perceived behavioral control through resource provision, barrier reduction, and confidence enhancement, thereby influencing health-promoting behaviors.

Research Hypotheses

Health literacy denotes an individual's capacity to comprehend and utilize health information for making informed decisions regarding their health. According to the TPB, health literacy affects health behaviors by shaping attitudes, subjective norms, perceived behavioral control, and behavioral intentions. Previous research has demonstrated a substantial correlation between health literacy and health behaviors, primarily due to the enhanced understanding of health information among individuals with higher health literacy levels. Berkman et al. (2011) have identified that individuals with limited health literacy are more inclined towards behaviors like inadequate drug usage and are less likely to adopt healthy practices such as regular physical activity, balanced diet, and smoking cessation. Soroya et al. (2023) showed that health literacy, internet, social media use, and health information-seeking behavior directly and indirectly positively impact self-care behavior. Enhancing health literacy levels is thus a crucial approach to promoting health behaviors and improving health outcomes. Moreover, individuals with elevated health literacy tend to participate in preventive health actions like cancer screening and vaccination, as Zhang et al. (2022) highlighted during the COVID-19 pandemic. Thus, the proposed hypothesis is:

H1: Health literacy has a positive effect on health behaviors.

Health empowerment plays a crucial role in shaping health behaviors by enhancing individuals' health capability, enabling them to assume command over their health and overall well-being. Shamlou et al. (2022) showed that perceived behavioral control significantly affects health behavior. Furthermore, strategies aimed at health empowerment can impact health behaviors significantly, fostering active engagement and involvement in healthcare decision-making processes and adherence to treatment and prevention regimens. Furthermore, Hawash et al. (2024) showed that increased empowerment leads to greater engagement in health-promoting activities. Thus, the proposed hypothesis is:

H2: Health empowerment has a positive effect on health behaviors.

According to TPB, health empowerment is related to health literacy as it fosters confidence and motivation to acquire and use health knowledge. An individual's health empowerment denotes their capability to take charge of their health and overall well-being. Enhancing health literacy encompasses acquiring knowledge, skills, resources, and assistance necessary for making informed decisions regarding health matters. Health literacy also pertains to the aptitude to access and comprehend health-related

information to facilitate informed choices concerning personal health (Nutbeam, 2008). Individuals who can oversee their health affairs are more inclined to locate and comprehend health information pertinent to their requirements.

Moreover, they are better equipped to possess the necessary skills and resources for obtaining intricate health details, thus enabling them to make knowledgeable decisions regarding their health, as evidenced by Berkman et al. (2011) in their respective studies on health empowerment initiatives and educational approaches fostering enhanced health literacy. Consequently, this enhancement is anticipated to culminate in adopting healthier lifestyle practices and achieving improved health outcomes. Consequently, advocating for the development of health competence and literacy emerges as a pivotal factor in enhancing health outcomes and elevating individuals' overall quality of life. Thus, the proposed hypothesis is:

H3: Health empowerment has a positive effect on health literacy.

Social support entails the provision of assistance and concern by various individuals, including acquaintances, relatives, and healthcare professionals. Xie et al. (2024) proposed that social support comprises assistance received from individuals, companions, and family members, leading to a negative relationship with the occurrence of mental health problems. Furthermore, Neethu et al. (2023). identified that a positive and supportive social environment facilitates individuals' ability to change their attitudes and behaviors toward health. Therefore, individuals with sufficient social relationships are more likely to engage in actions that promote health, have more self-esteem, and, ultimately, are healthier. Thus, the proposed hypothesis is:

H4: Social support has a positive effect on healthy behaviors.

According to the TPB, health empowerment is related to health literacy as it fosters confidence and motivation to acquire and use health knowledge. Lo et al. (2023) showed the considerable effect of perceived social support on mental health literacy. Furthermore, Glaser et al. (2020) found that social support from healthcare providers is associated with a better understanding of health information among working women. Therefore, these findings underscore the importance of social support in promoting health literacy and improving health outcomes. Thus, the proposed hypothesis is:

H5: Social support has a positive effect on health literacy.

Health empowerment affects health behaviors by enhancing health literacy. Soroya et al. (2023) showed that health literacy and health information-seeking behavior positively mediated the relationship between internet and social media use, health anxiety, and self-care. Consequently, health literacy is significantly linked to behavior, particularly in populations where health empowerment plays a critical role in shaping health-related conduct. Furthermore, Zhang et al. (2022) demonstrated that health literacy and perceived obstacles act as mediating factors in the realm of health behaviors during the COVID-19 pandemic. Therefore, health literacy is pivotal in fostering individual health behaviors by diminishing impediments to healthy living and health-related decision-making. Thus, the proposed hypothesis is:

H6: Health empowerment indirectly effects health behaviors, mediated by health literacy.

Social support, health behaviors, and health literacy are determinants associated with health results. Studies have shown that social support is a significant intermediary factor in the relationship between knowledge and health behaviors. Brunner et al. (2019) explain that social support is positively associated with health and well-being in the workplace. Various sources of social support, particularly supervisor support, are significant resources for health and well-being at work and are considered key factors in promoting workplace health. Liu et al. (2021) also identified a favorable connection among social support, health literacy, health behaviors, and health outcomes. Thus, the proposed hypothesis is:

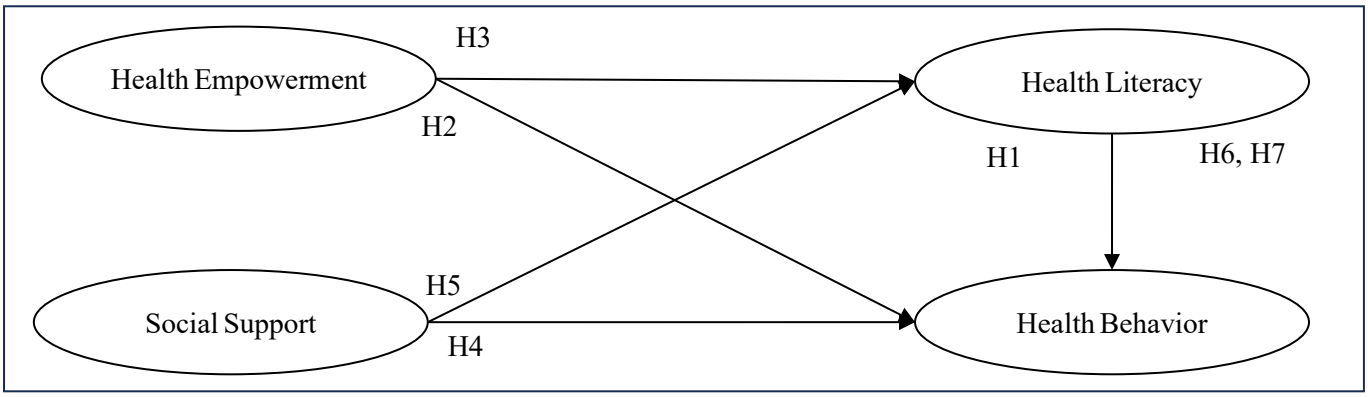
H7: Social support indirectly effects health behaviors, mediated by health literacy.

Conceptual Framework

This research embraces the health behavior concept of Pender et al. (2006), the health literacy concept of Nutbeam (2008), the health empowerment concept of Shearer (2009), and the social support concept of Thakur et al. (2020) to structure the research framework, as depicted in Figure 1.

Figure 1

Conceptual Framework



Method

Research Design

This research design used a quantitative research method. It examined the role of health literacy as a mediator variable. The independent variables are health empowerment and social support, and the dependent variable is health behaviors.

Sample and Procedure

This research sample consists of university staff from 10 universities in Thailand. The sample size was calculated to be ten times the number of observed variables (Schreiber et al., 2006). This research has 32 observed variables, resulting in a sample size of 320. This research distributed the questionnaire to the personnel division of ten universities from six regions in Thailand from January to March 2023. The sampling of this research was done randomly using a two-stage sampling method: cluster sampling and simple random sampling. This is because the population is naturally divided into the size of university clusters. The research distributed 400 questionnaires, received 365 questionnaires back, eliminated 45 incomplete questionnaires, and achieved 320 complete questionnaires, resulting in a response rate of 80 percent.

Instruments

This research utilized a questionnaire to collect data, comprising items related to personal factors in a 5-item checklist format and items related to each variable in a rating scale format, which are further described.

Health Empowerment

Health empowerment is measured using the six-item scale developed by Shearer (2009). One example is, “How do you think positively about your health?”

Social Support

Social support is measured using the six-item scale developed by Thakur et al. (2020). One example is, “How do coworkers help you with your health?”

Health Literacy

Health literacy is measured using the twelve-item scale developed by Nutbeam (2008). One example is, “How do you search for and select accurate health information?”

Health Behaviors

Health behaviors are measured using the eight-item scale developed by Pender et al. (2006). One example is, "How do you regularly check your health?"

These items were assessed using a rating scale, and content validity was verified using the index of objective congruence (IOC). Additionally, reliability was examined with a sample of 30 individuals not included in the primary sample, using Cronbach's alpha coefficients (α) for each variable. The values for each scale were .92, .95, .96, and .93, respectively, all exceeding .70 (Hair et al., 2020). To ensure cultural relevance and accuracy, all questionnaires originally in English were translated into Thai and then independently back translated to English. This process involved comparing the back-translated version with the original to resolve any discrepancies, thus preserving the integrity of the instruments in the Thai cultural context.

Data Analysis

This research utilizes ADANCO 2.4 statistics software for composite-based structural equation modeling to estimate parameters, which can effectively estimate parameters under the violation of the multivariate normal distribution condition (Henseler, 2021). Hypothesis testing is conducted using the bootstrap method with 4,999 Bootstrap samples (Henseler, 2021), and the data analysis process consists of the following steps: 1. Tests of overall model fit: This involves evaluating the overall model fit using the standardized root mean square residual (SRMR), ideally less than .08 (Hair et al., 2020). Additionally, the Unweighted Least Squares Discrepancy (d_{ULS}) and Geodesic Discrepancy (d_G) should fall between the 95th and 99th percentiles (HI95 and HI99) (Henseler, 2021). 2. Measurement model/outer model evaluation: This involves examining the relationship between the latent variables and their reflective constructs. It comprises: 2.1 Reliability, using factor loading, α, Dijkstra-Henseler's rho (ρA), and Jöreskog's rho (ρC). Factor loading, α, ρA, and ρC should ideally be greater than .70 (Henseler, 2021). 2.2 Convergent validity, assessed through the Average Variance Extracted (AVE) derived from factor loadings, indicating the relationship between latent and observed variables. AVE should ideally be more significant than .70, and AVE should be greater than .50 (Fornell & Larcker, 1981). 2.3 Discriminant validity evaluated using the heterotrait-monotrait ratio of correlations (HTMT), where the HTMT for all variables should be less than .85 (Henseler, 2021). 3. Structural model testing involves examining the effect between latent variables using path coefficients, determination coefficients (R^2), and effect sizes (f^2), where the p-value of path coefficients should be less than .05 (Hair et al., 2020). Therefore, R^2 should approach 1, and f^2 should be large (Henseler, 2021).

Results

Descriptive Analysis

Data was gathered from questionnaires distributed to university staff in Thailand, totaling 320 individuals. A majority were females, numbering 196 (61.3%). Ages ranged from 31 to 40 years, with 138 individuals (43.1%) falling into this category. Furthermore, 131 individuals (40.9%) held master's degrees, and 201 (62.8%) were support staff. Regarding monthly income, 111 individuals (34.7%) reported earnings between THB 20,001–30,000 (USD 545–817). Descriptive statistics for the observed variables included arithmetic means ranging from 3.40 to 4.14, standard deviations from .73 to 1.09, skewness from –.65 to –.05, and kurtosis from –.79 to .30. The Variance Inflation Factor (VIF) for each observed variable ranged from 1.37 to 4.58, all below 5, indicating no multicollinearity problem with the model (Hair et al., 2020)

Structural Equation Modeling Analysis

The analysis of structural equation modeling comprises overall model testing, measurement model testing, and structural model testing, as detailed below.

Overall Model Testing

Found that the model' s SRMR value is .06, less than .08, indicating an acceptable model. However, the values of dULS and dG are outside the range of HI95 and HI99.

Measurement Model Testing

Reliability. Each observed variable of latent variables EMP, SUPP, HLTH, and BEH has factor loadings ranging from .53 to .91, exceeding .50. Cronbach's alpha (α) ranges from .89 to .96, ρA ranges from .90 to .96, and ρC ranges from .91 to .96, all-surpassing .70, indicating high reliability for all latent variables in the model (Henseler, 2021), as shown in Table 1.

Table 1

Measurement Model Evaluation

Latent variable	Observed variable	β	R^2	ρ_A	ρ_c	α	AVE
EMP	emp01	.80	.65	.92	.93	.91	.70
	emp02	.74	.55				
	emp03	.86	.74				
	emp04	.85	.72				
	emp05	.91	.83				
	emp06	.84	.71				
SUPP	supp01	.80	.65	.92	.94	.92	.72
	supp02	.82	.68				
	supp03	.90	.80				
	supp04	.91	.82				
	supp05	.80	.64				
	supp06	.87	.76				
HLTH	hlth01	.79	.63	.96	.96	.96	.69
	hlth02	.80	.64				
	hlth03	.85	.72				
	hlth04	.86	.74				
	hlth05	.82	.68				
	hlth06	.80	.65				
	hlth07	.81	.66				
	hlth08	.82	.73				
	hlth09	.86	.76				
	hlth10	.87	.76				
	hlth11	.87	.75				
	hlth12	.84	.70				
BEH	beh01	.75	.56	.90	.91	.89	.56
	beh02	.76	.57				
	beh03	.70	.48				
	beh04	.83	.69				
	beh05	.81	.65				
	beh06	.53	.28				
	beh07	.81	.66				
	beh08	.79	.63				

Note. EMP = health empowerment, SUPP = social support, HLTH = health literacy, BEH = health behaviors, β = standardized factor loading, R^2 = indicator reliability, ρA = Dijkstra-Henseler's rho, ρc = Jöreskog's rho, α = Cronbach alpha coefficient, and AVE = average variance extracted.

Convergent Validity. Each latent variable has an AVE ranging from .56 to .72, exceeding .50, indicating that the indicator variables converge well with their respective latent variables (Fornell & Larcker, 1981), as shown in Table 1.

Discriminant validity. All latent variables have a heterotrait-monotrait ratio of correlations (HTMT) less than .85 (HTMT of SUPP-EMP = .65, HLTH-EMP = .83, BEH-EMP = .81, HLTH-SUPP= .65, BEH-SUPP=.68, BEH-HLTH=.80) (Henseler et al., 2021), indicating discriminant validity for all pairs of latent variables.

Structural Model Testing

Testing the Effect of Latent Variables in the Structural Equation Model. The examination of the effect of latent variables in the structural equation model resulted in the testing of hypotheses, as presented in Table 2.

Table 2
Path Coefficient of Structural Model

Independent variable	Dependent variable	Direct effect	*t*-statistics	*p*	R^2	f^2
EMP	BEH	.39	5.56	< .001**	.64	.17
EMP	HLTH	.60	15.88	< .001**		.66
SUPP	BEH	.11	2.02	.04*	.64	.02
SUPP	HLTH	.28	6.82	< .001**		.14
HLTH	BEH	.38	4.75	< .001**		.15

Note. EMP = health empowerment, SUPP = social support, HLTH = health literacy, BEH = health behaviors, * $p < .05$, ** $p < .01$, R^2 = coefficient of determination, f^2 = effect size.

H1: Health empowerment (EMP) significantly effects health behavior (BEH) ($\beta = .39$, $p < .001$) with an effect size of .17.

H2: Health empowerment (EMP) significantly effects health literacy (HLTH) ($\beta = .60$, $p < .001$) with an effect size of .66.

H3: Social support (SUPP) significantly effects health behavior (BEH) ($\beta = .11$, $p < .04$) with an effect size of .02.

H4: Social support (SUPP) significantly effects health literacy (HLTH) ($\beta = .28$, $p < .001$) with an effect size of .14.

H5: Health literacy (HLTH) significantly effects health behavior (BEH) ($\beta = .38$, $p < .001$) with an effect size of .15.

The effect sizes (f^2) further supported the significance of the relationships, with notable effects of health empowerment on health literacy ($f^2 = .66$), which means a large effect size, while the effect sizes of health empowerment and health literacy on health behavior equal .17 and .16, which mean a medium effect size. The effect size of social support on health behavior and health literacy equals .14 and .02, which means a small effect size.

Testing the Effect of Health Literacy as a Mediator Variable. The hypothesis test results of health literacy's effect as a mediator variable are shown in Table 3.

Table 3
Testing the Effect of Health Literacy as a Mediator Variable

Independent variable	Dependent variable	Indirect effect	*t*-statistics	*p*
EMP	BEH	.23	4.35	< .001**
SUPP	BEH	.11	3.57	< .001**

Note. EMP = health empowerment, SUPP = social support, HLTH = health literacy, BEH = health behaviors, ** $p < .01$.

H6: Health empowerment (EMP) significantly effects health behavior (BEH) ($\beta = .23$, $p < .001$) with health literacy (HLTH) as a partial mediator variable.

H7: Social support (SUPP) significantly effects health behavior (BEH) ($\beta = .11$, $p < .001$) with health literacy (HLTH) as a partial mediator variable.

Discussion and Conclusion

Discussion of Main Results

The main purpose of this study was to examine the factors influencing health behavior and the mediating role of health literacy in the health behavior of university staff in Thailand. The findings from the research study are discussed, and suggestions proposed.

The first finding suggests that health empowerment is the primary factor impacting health behaviors. This research suggests that health empowerment involves individuals managing their well-being by acquiring knowledge, skills, and resources to make informed decisions. This encompasses self-acceptance, self-improvement, life goals, and improved health management abilities, empowering individuals to take charge of their health. Consequently, this enhances personal health outcomes, healthcare, disease prevention, and self-health behavior changes. These findings expand on the theory of planned behavior (TPB), illustrating how empowerment strengthens an individual's capacity to develop positive attitudes toward health behaviors (Ajzen, 2012). The research aligns with McAnally and Hagger (2023), indicating that self-perceived ability and attitude mediate health behaviors and outcomes. Furthermore, Supriyati et al. (2021) found that the success of promoting healthier behavior and its effectiveness in enhancing knowledge and practices related to health among university staff involved engaging and empowering staff, as well as providing support and capacity-building initiatives that enabled individuals to easily adopt the suggested behaviors.

Therefore, the university administration should implement policies to evaluate the professional development of health personnel. It should organize activities that promote self-improvement, foster relationships, encourage healthier nutritional behaviors, create physical activity-friendly environments within the university, and address the stress experienced by university staff. These efforts empower staff to manage their health, engage in physical activity, maintain proper nutrition, strengthen relationships, and achieve workplace happiness.

The second finding on the role of health literacy as a mediator between health empowerment and health behaviors. This research suggests that health empowerment is a process wherein individuals possess the appropriate decision-making authority concerning their health, encompassing mental, emotional, and physical capacities, ultimately leading to health literacy. This process entails being receptive to novel experiences to accomplish established objectives. Pursuing these objectives necessitates acquiring essential knowledge and abilities for effective health management, encompassing health-related information, options, and decision-making concerning health, along with the capacity to comprehend and utilize health-related information to make well-informed decisions about one's health. According to the World Health Organization (2021), individuals' educational capabilities significantly impact their health literacy and health behaviors. These findings extend the TPB, emphasizing the critical role of health literacy in influencing behavioral intentions. Health empowerment reflects a commitment to achieving health literacy, which drives changes in the health behaviors of university staff (Ajzen, 2012). Research outcomes agree with Soroya et al. (2023), who found that health literacy had a direct and indirect positive effect on self-care behavior. Moreover, Gernert et al. (2022) explain that employees with health-related risk factors should focus on self-regulation and self-perception to promote health literacy and enhance work ability.

Therefore, the relevant institute within the university must establish guidelines to promote health empowerment by fostering positive health attitudes tailored to each staff member' s unique needs and physical status. When university staff adopt favorable health attitudes, they actively seek health-related information, practice self-regulation, and independently manage their health behaviors. Moreover, staff with positive health attitudes exhibit practical communication skills, enabling them to share health information with others and highlighting the benefits of adopting healthy behaviors.

The third findings on the role of health literacy as a mediator between social support and health behaviors. This research suggests that social support entails establishing connections among individuals in terms of health, cultivating comprehension and confidence to endorse health-related information that leads

to changes in behavior. It allows individuals to acquire knowledge and insight into their health and the capacity to self-regulate by establishing objectives, strategizing, and implementing actions per the established plans. Furthermore, it empowers individuals to make well-informed choices regarding their health. On the other hand, health literacy involves obtaining health-related information and services and possessing skills in comprehension, communication, self-regulation, decision-making, and media literacy. Individuals with health literacy possess comprehension and can make educated decisions about their health, adjusting health behaviors suitably. These findings extend TPB, highlighting health literacy as a key mediator between social support and health behaviors. By improving knowledge, shaping attitudes, and strengthening perceived control, health literacy significantly affects the intentions and actions related to health behaviors among university staff (Ajzen, 2012). Similarly, Neethu et al. (2023) suggested strengthening social relationships among individuals, thereby improving health and quality of life. This was in line with Ohadomere and Ogamba (2021), who suggested that good communication is essential for building strong working relationships and social support between management and employees and increasing loyalty and integrity, which directly and indirectly benefits occupational health. Therefore, the university administration should establish guidelines for providing social support to enhance the health of university staff and utilize social support to improve data management, health advocacy, technology use, and informed decision-making.

Limitations

This study has some limitations. Firstly, the research findings show that health empowerment has the highest effect on health literacy and health behavior, indicating that health empowerment is a crucial factor for health behavior. Future research should deploy research and development methodologies and participatory action research to enhance health empowerment among university staff. Secondly, this study employed quantitative research to explore the relationships between variables, providing an overview of health behaviors. Future research should use qualitative research to gain a deeper understanding of the diverse health behaviors of university staff.

Implications for Behavioral Science

This result can inform the field of behavioral science, as well as policies and activities that promote health literacy and health behavior among Thai university staff. Firstly, this research supports the concept of health behavior (Pender et al., 2006) to explain the effect of health empowerment (Shearer, 2009) as a mediator variable in promoting good health behaviors, which aligns with the work of McAnally and Hagger (2023). It highlights the necessity of guidelines that foster health empowerment by cultivating personalized health mindsets, as favorable health attitudes are associated with proactive health information seeking, self-regulation, independent health management, and proficient communication of healthy practices. Secondly, the findings of this research indicate that health empowerment is a crucial factor influencing health behaviors, both directly and indirectly, with health literacy as a mediator variable. This supports the work of Soroya et al. (2023). It highlights the importance of health literacy as a mediator of self-care behavior, and Shamlou et al. (2022) showed that perceived behavioral control significantly affects health behavior. Thus, promoting health behavior adaptation necessitates social support and health empowerment to cultivate individual health literacy.

Conclusion

In conclusion, this research establishes the crucial significance of health empowerment in influencing the health behaviors of Thai university staff. It proposes that Thai university administrators should be responsible for establishing and overseeing institutional health policies to cultivate health-conscious attitudes through programs that align health goals with faculty performance indicators and facilitate health assessments. Furthermore, the study highlights health literacy as a crucial moderator of health behaviors, suggesting that university administrators should establish explicit health literacy policies and regularly monitor their advancement. Implementing initiatives aimed at improving health literacy,

analytical thinking, and decision-making abilities is imperative, in addition to endorsing both internal and external health-related communication to promote the adoption of healthier behaviors.

Declarations

Funding: Faculty of Education, Silpakorn University.
Conflicts of Interest: The authors declare no conflicts of interest.
Ethical Approval Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board from the Human Research Ethics Committee at the Research and Development Institute Silpakorn University, Nakhon Pathom (REC 65.1226-217-10825, dated December 26, 2022).

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