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Factors influencing value-based care application among medical students and postgraduate in Thailand

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Abstract

Background The adoption of Value-Based Care (VBC) is essential for enhancing healthcare quality and efficiency, with implications for future healthcare delivery. The primary outcome of this study was to determine factors influencing the application of VBC principles among sixth-year medical students and postgraduate trainees in Thailand. Understanding these factors is essential for designing targeted educational interventions that prepare trainees for patient-centered healthcare practice.

Methods We conducted a cross-sectional study at the Faculty of Medicine, Prince of Songkla University, involving 90 participants, including 51 postgraduate trainees and 39 sixth-year medical students. Participants completed a comprehensive online questionnaire assessing their VBC-related attitudes, perceptions, intentions, and applications. Data analysis included descriptive statistics, Spearman correlation, and multiple linear regression.

Results Distinct differences in VBC application scores were evident between the two groups. Moderate associations were found between attitudes and perceptions ($r=0.44$, $p<0.001$), as well as between intentions and applications ($r=0.53$, $p<0.001$). Regression analysis identified family health history ($\beta=4.32$, 95% CI: 0.69 to 7.94, $p=0.021$) as a key predictor among sixth-year medical students, while financial security ($\beta=4.33$, 95% CI: 1.69 to 6.97, $p=0.002$) was significant for postgraduate trainees. Perception ($\beta=0.32$, 95% CI: 0.10 to 0.54, $p=0.005$) and intention ($\beta=0.42$, 95% CI: 0.10 to 0.73, $p=0.011$) were significant predictors for both groups, particularly among postgraduate trainees.

Conclusions This study underscores the critical influence of personal and financial factors on VBC adoption among medical students and trainees. Integrating targeted educational strategies addressing these predictors could enhance VBC education, better preparing students for patient-centered healthcare practice.

Keywords Value-based care, Medical education, Health system science, Educational strategies, Patient-centered healthcare

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Background

Health System Science (HSS) constitutes a fundamental component of modern medical education, emphasizing the delivery of high-quality, cost-effective healthcare through comprehensive understanding of complex healthcare systems and their interrelationships [1, 2]. Central to HSS is the concept of value-based care (VBC), which aims to optimize patient satisfaction, resource utilization, and cost-effectiveness, while also reducing hospital readmissions and improving health outcomes [3, 4]. However, the integration of VBC into healthcare systems varies significantly [5–7].

For instance, the Triple Aim framework in the United States exemplifies how aligning provider incentives with patient outcomes can effectively transform healthcare delivery [8, 9]. Especially in the post-COVID-19 era, VBC is increasingly recognized as a pivotal strategy for addressing the escalating economic burden of healthcare expenses [10]. The VBC model encompasses strategies aimed at minimizing unnecessary medical expenditures by prioritizing patient-centered practices and focusing on patient priorities, which are vital as we transition towards a more patient-centered approach. This transition not only enhances patient satisfaction and health outcomes but also contributes to the long-term financial sustainability of healthcare systems [11].

Integrating VBC into medical education is becoming increasingly crucial as healthcare systems worldwide shift towards models that emphasize cost-effectiveness and patient-centered outcomes. Educational strategies that incorporate VBC principles are essential for equipping a new generation of physicians with the skills to navigate these changes adeptly [12, 13]. Furthermore, embedding VBC into the curriculum aligns with global health policy trends that prioritize sustainable healthcare practices [14]. Previous research has highlighted that the implementation of VBC requires a fundamental transformation in medical education, emphasizing patient-centered learning, outcome measurement, interdisciplinary collaboration, and continuous improvement [15].

While VBC is well-established in Western medical education, its adoption in Eastern contexts, including Thailand, remains limited. Eastern medical training, often characterized by hierarchical structures and paternalistic care models, contrasts with Western approaches. Existing VBC research in the East is primarily from India, emphasizing the need to restore humanistic values in medicine [16]; however, limited studies have explicitly examined how Thai medical trainees perceive and practically apply VBC principles, leaving a notable knowledge gap regarding cultural and systemic influences in this context.

Our research focuses on sixth-year medical students and postgraduate trainees at the Faculty of Medicine, Prince of Songkla University, to investigate their engagement with VBC. This instrument adapts existing behavioral theory models to suit the specific context of medical training and practice. We seek to uncover how these future healthcare professionals perceive and implement VBC principles. By identifying the key factors influencing their adoption of VBC, we aspire to provide actionable insights that can enhance medical education and inform the development of effective health policies for improved healthcare delivery.

Methods

Study design, setting, and participants

In December 2022, we conducted a cross-sectional study using an online questionnaire at the Faculty of Medicine, Prince of Songkla University in Hatyai, Thailand. This institution serves as a prominent hub for healthcare training in southern Thailand, attracting a diverse group of medical students from across the country. Our purposive sampling strategy targeted sixth-year medical students and postgraduate trainees, chosen for their pivotal position on the cusp of transitioning from academic theory to clinical practice. Sixth-year medical students represent the highest level of undergraduate training, where they begin applying Value-Based Care (VBC) principles in real-world settings. Evaluating VBC application in students below this level is questionable due to their limited clinical exposure. Postgraduate trainees, as newly graduated doctors, independently implement VBC in patient care, making them a critical group for assessing early practical application. Additionally, we considered the educational background of these trainees, whether they were from our institution or different academic ecosystems, to ensure a diverse and comprehensive sample that reflects varying experiences in VBC integration. Eligible participants included willing sixth-year medical students and postgraduate trainees actively engaged in direct patient care for at least three months. Exclusions were made for individuals who did not provide explicit consent to participate in the study, ensuring adherence to ethical research standards.

Data collection and questionnaire development

We developed an online questionnaire to assess participants' application of VBC principles in patient care. Guided by the STEEEP model principles [17]—Safe, Timely, Effective, Efficient, Equitable, and Patient-centered care—which serve as a quality improvement tool widely adopted across health systems to achieve VBC objectives and align with the Triple Aim framework [8], the survey comprised six sections addressing demographic variables and VBC-related factors.

The questionnaire was structured into sections focusing on attitudes, social norms, perceptions, intentions, and practical application of VBC principles and included

factors such as gender, age, education level, study program, and health-related variables.

In our VBC-related sections, we developed a conceptual framework that adapts existing behavioral theory models [18–21] to the specific context of medical training and practice. Each section featured questions tailored to reflect specific behavioral models, culminating in a total of 62 questions: 11 questions each to gauge attitudes, social norms from seniors, and social norms from teachers, followed by 9 questions assessing perceptions, 10 evaluating intentions, and 10 focusing on behavior application. Responses were collected using a five-point Likert scale, allowing for a total possible score of 55 for attitudes, as an example.

The draft questionnaire underwent rigorous review by three medical education experts, chosen for their extensive expertise. Feedback was collected online, and the questionnaire was revised accordingly. A pilot test with 30 participants was conducted to refine the questionnaire. We clarified health economics terms, neutralized procedural descriptions for consistency across groups, and ensured the STEEEP framework aligned with real-world VBC application, enhancing accuracy and reliability. Cronbach's alpha was calculated for each section, demonstrating high reliability: 0.90 for attitudes, 0.91 for social norms, 0.85 for perceptions, 0.91 for intentions, and 0.93 for behavior, respectively.

Data collection commenced after approval from the relevant Research Ethics Committee and the educational institutions. The survey was administered via Google Forms in December 2022 and January 2023. Participants were recruited through private online groups such as Line® and Facebook®, ensuring confidentiality. They were required to electronically sign a consent form prior to participation. All questionnaire responses were anonymized and accessible only to the principal investigator. No incentives were offered for participation.

Data management and statistical analysis

Data collection occurred using Google Forms®, with subsequent processing in Microsoft Excel®. Detailed statistical analyses were performed in R version 4.2.2, utilizing appropriate packages for data analysis and visualization [22, 23]. Categorical and continuous variables were summarized using frequencies/percentages and means/standard deviations, respectively. Associations between personal factors and VBC scores were examined using t-tests, Wilcoxon Rank Sum tests, and Spearman rank correlation coefficients for parametric and non-parametric data. Predictive factors influencing VBC scores were initially identified through univariate analysis with a significance level of $P < 0.2$, and refined using backward stepwise regression based on the Akaike Information Criterion (AIC). Model diagnostics were conducted, including variance inflation factor (VIF) assessments to check for multicollinearity, and evaluated goodness-of-fit using QQ plots and histograms of residuals. The final multiple regression models reported adjusted coefficients (β) for each predictor, along with their 95% confidence intervals (CI). Statistical significance was established at a P-value threshold of < 0.05.

Results

The study, with a response rate of 18%, elicited responses from 90 participants who completed the online questionnaire. Among them, 56.67% were postgraduate trainees, and 43.33% were sixth-year medical students. Participant demographics, detailed in Table 1, revealed a predominance of females in both groups, with median ages of 24 and 26 years for undergraduate and postgraduate participants, respectively.

Undergraduates predominantly hail from a general medical program (69.2%) and are covered by the universal coverage scheme (76.9%). Postgraduates mostly accessed healthcare through social security schemes (41.2%). The family net income reported by most undergraduates ranged from 50,000 to 100,000 baht (64.1%), a finding echoed by postgraduates, with smaller percentages (39.2%). The perception of family socioeconomic status as secure was reported by 71.8% of undergraduates and 66.7% of postgraduates. Focusing on the postgraduate experience, a majority had 1–3 years of work experience after graduation (60.8%), with many having spent less than a year working in community hospitals post-graduation (66.7%).

The statistical comparison of VBC application scores (Table 2) between groups highlighted a significant disparity, with postgraduate trainees scoring higher (mean application score of 41.12 {SD = 6.06}) than sixth-year medical students {SD = 6.33} ($p = 0.03$). However, differences in other domains—attitude, senior influence, teacher influence, perception, and intention—were not statistically significant. This singular finding of significance ($p < 0.05$) suggests a potential gap in VBC application that may be influenced by the level of clinical experience or education.

Spearman correlation analysis (Figs. 1, 2 and 3), illustrated the relationship dynamics among questionnaire domains. Attitude consistently correlated with both senior and teacher norms across all participant groups, while perception and intention exhibited more substantial correlation with application, particularly among postgraduate trainees, where intention shows a notable correlation ($r = 0.53$) (Fig. 3). This pattern suggests that while attitudes and norms contribute to the framework of VBC understanding, it is the perception of and intention towards VBC that are more directly connected to its application in practice.

Table 1 Baseline characteristics of the study participants divided by sixth-year medical student and postgraduate trainees

Baseline characteristics (*N*, %)	**Sixth-year medical students 39 (43.33)**	**Postgraduate trainees 51 (56.67)**	**Total 90 (100)**
Gender (*N*, %)			
- Female	24 (61.5)	32 (62.7)	56 (62.2)
- Male	15 (38.5)	19 (37.3)	34 (37.8)
Age (median, IQR)	24 (23.5,25)	26 (25,28)	25 (24,27)
Level of education (N, %)			
- High school	35 (89.7)	0 (0)	35 (38.9)
- Bachelor's degree	4 (10.3)	51 (100)	55 (61.1)
Study program (N, %)			
- General program	27 (69.2)	-	27 (69.2)
- Rural doctor program	12 (30.8)	-	12 (30.8)
Underlying disease (N, %)	3 (7.7)	7 (13.7)	10 (11.1)
Family members with chronic disease (N, %)	21 (53.8)	26 (51)	47 (52.2)
Health coverage scheme (N, %)			
- Universal coverage scheme	30 (76.9)	11 (21.6)	41 (45.6)
- Social security scheme	0 (0)	21 (41.2)	21 (23.3)
- Government officer	7 (17.9)	13 (25.5)	20 (22.2)
- Others	2 (5.1)	6 (11.8)	8 (8.9)
Family net income (N, %)			
- 10,000 – 50,000 baht	8 (20.5)	12 (23.5)	20 (22.2)
- 50,000 – 100,000 baht	25 (64.1)	20 (39.2)	45 (50)
- > 100,000 bath	6 (15.4)	19 (37.3)	25 (27.8)
Perceived family socioeconomic status (N, %)			
- Secure	28 (71.8)	34 (66.7)	62 (68.9)
- Non-secure[#]	11 (28.2)	17 (33.3)	28 (31.1)
Working experience after graduation (N, %)			
- < 1 year	-	6 (11.8)	6 (11.8)
- 1 – 3 years	-	31 (60.8)	31 (60.8)
- > 3 years	-	14 (27.5)	14 (27.5)
Working experience in community hospital after graduation (N, %)			
- < 1 year	-	34 (66.7)	34 (66.7)
- 1 – 3 years	-	13 (25.5)	13 (25.5)
- > 3 years	-	4 (7.8)	4 (7.8)
Residency departments (N, %)			
- Surgery		11 (21.6)	11 (21.6)
- Otolaryngology		8 (15.7)	8 (15.7)
- Internal medicine		7 (13.7)	7 (13.7)
- Family and Preventive medicine		5 (9.8)	5 (9.8)
- Pediatrics		5 (9.8)	5 (9.8)
- Obstetrics and gynecology		4 (7.8)	4 (7.8)
- Rehabilitation		4 (7.8)	4 (7.8)
- Ophthalmology		3 (5.9)	3 (5.9)
- Orthopedics		2 (3.9)	2 (3.9)
- Radiology		1 (2.0)	1 (2.0)
- Anesthesiology		1 (2.0)	1 (2.0)
Residency year (N, %)			
- Year 1		21 (41.2)	21 (41.2)
- Year 2		12 (23.5)	12 (23.5)
- Year 3		12 (23.5)	12 (23.5)
- Year 4		5 (9.8)	5 (9.8)
- Year 5		1 (2.0)	

Note: IQR = interquartile range

[#]non-secure perception of family socioeconomic status means not sure or insecure

Table 2 Comparison of the summarized score of each questionnaire part for sixth-year medical students and postgraduate trainees

Factors	Sixth-year medical students ($n=39$)		Postgraduate trainees ($n=51$)		*p*-value	Total ($n=90$)	
	Mean	SD	Mean	SD		Mean	SD
Attitude	40.79	5.57	42.20	6.63	0.28	41.50	6.10
Senior	38.46	5.99	40.53	6.04	0.11	39.50	6.01
Teacher	38.67	6.17	40.45	6.51	0.19	39.56	6.34
Intention	41.13	5.23	40.78	4.58	0.75	40.96	4.91
Perception	34.46	4.25	34.18	6.56	0.80	34.32	5.41
Application	38.26	6.33	41.12	6.06	**0.03***	39.69	6.20

Note: SD = standard deviation, * p-value < 0.05

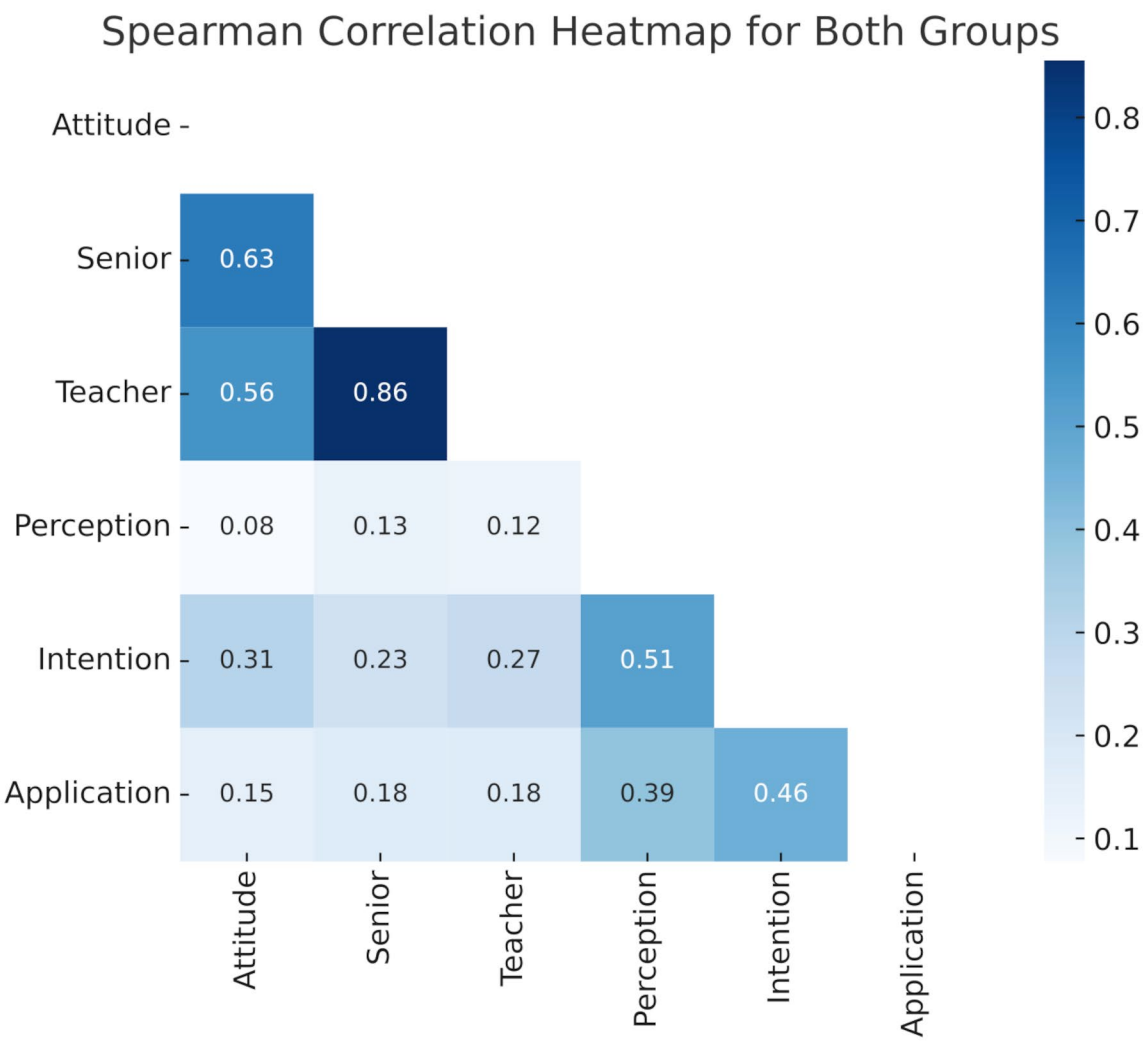

Fig. 1 Spearman correlation heatmap for all participants

Univariate analysis revealed that sixth-year medical students with family members having chronic diseases scored higher on application (mean score of 40.24, SD = 4.81) compared to those without such family background (mean score of 35.94, SD = 7.21), with a p-value of 0.04 (Table 3). In contrast, a secure family socioeconomic status was significantly associated with higher application scores among postgraduate trainees ($p = 0.003$), with these participants scoring a mean of 44.82 (SD = 3.03) compared to 39.26 (SD = 6.37) in those perceiving their status as non-secure (Table 4).

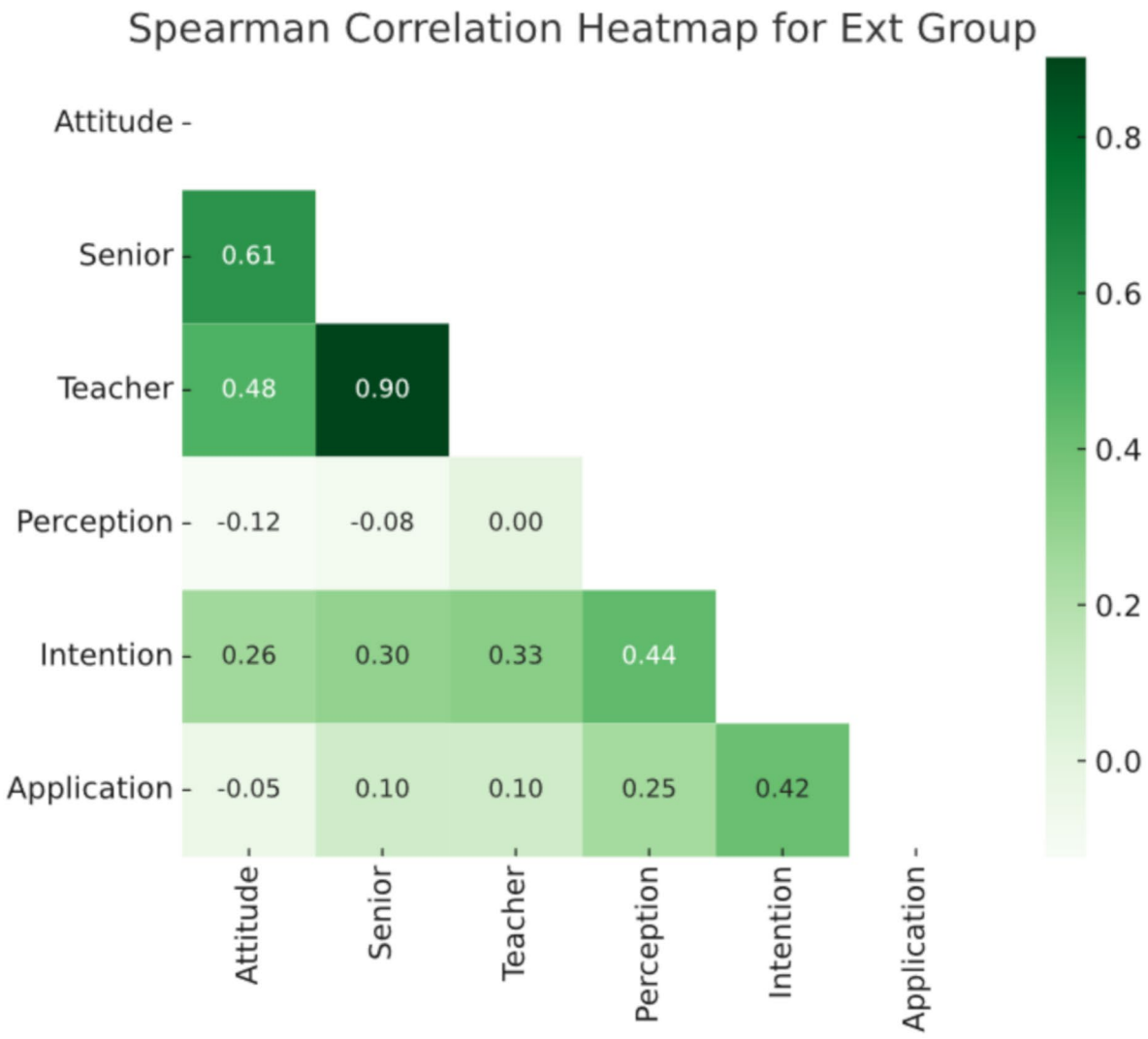

Fig. 2 Spearman correlation heatmap for sixth-year medical students (extern)

Multiple linear regression models (Table 5), identified predictors of application scores. In the sixth-year medical student group, the presence of family members with chronic diseases was associated with a significant increase of 4.32 points in the application score (95% CI: 0.69 to 7.94, $p = 0.021$). For postgraduate trainees, perception and intention were significant predictors of the application score, with coefficients of 0.32 (95% CI: 0.10 to 0.54, $p = 0.005$) and 0.42 (95% CI: 0.10 to 0.73, $p = 0.011$), respectively. Furthermore, a secure family socioeconomic status was associated with an increase of 4.33 points in the application score (95% CI: 1.69 to 6.97, $p = 0.002$) for postgraduate trainees.

Discussion

Our study revealed that postgraduate trainees scored higher in applying VBC principles compared to sixth-year medical students, highlighting the impact of greater clinical experience and practical exposure on their understanding and implementation of VBC. This finding is expected, as postgraduate trainees have more opportunities to engage in real-world patient care, make independent clinical decisions, and experience the direct consequences of cost-conscious, patient-centered healthcare practices. However, the significance of this result lies in the extent to which exposure alone accounts for the difference and whether targeted educational interventions at the undergraduate level could help bridge this gap earlier in medical training.

The Spearman correlation analysis illustrated the relationship between different VBC domains, with

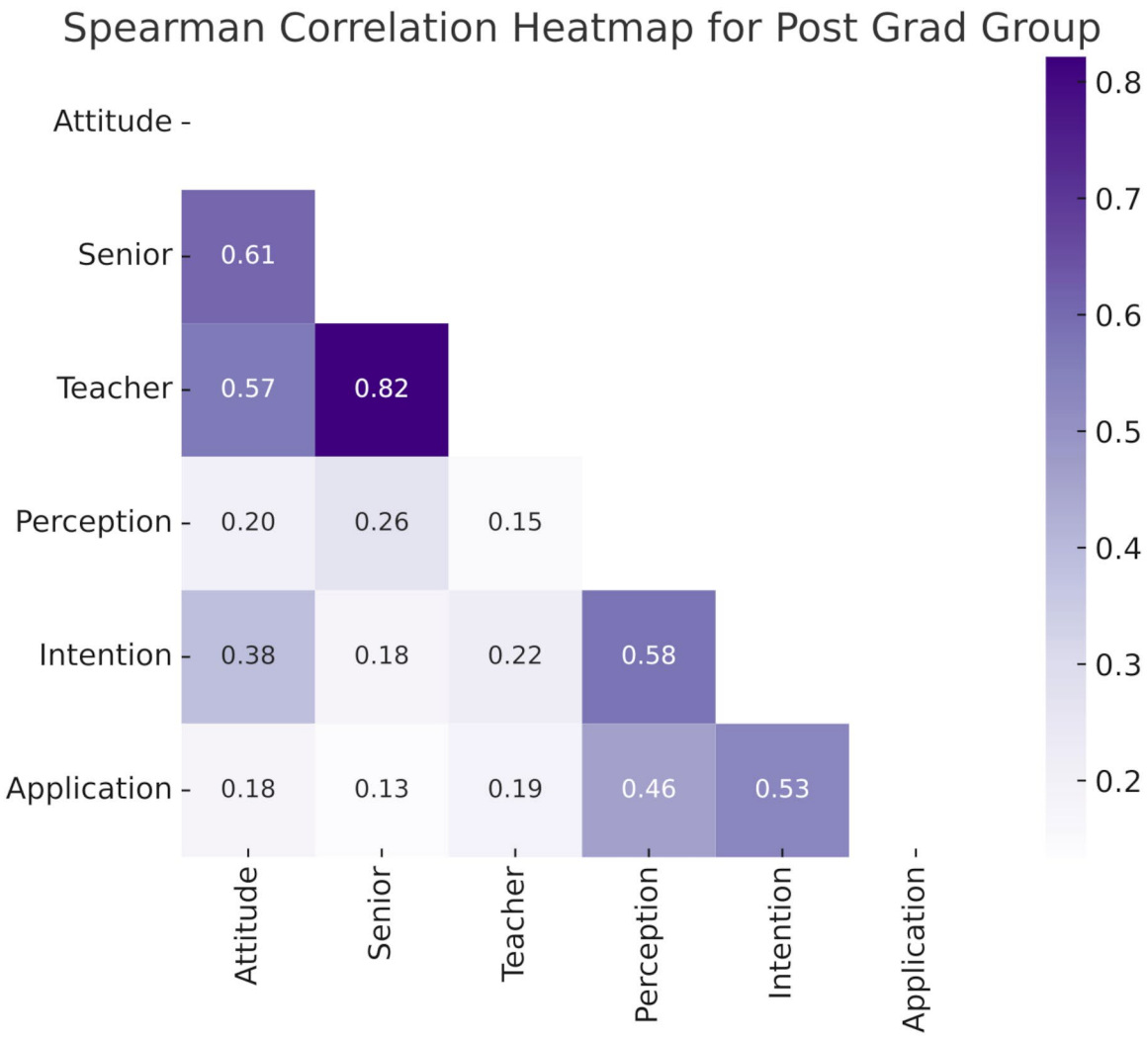

Fig. 3 Spearman correlation heatmap for postgraduated trainees

'Perception' and 'Intention' scores showing a stronger correlation with 'Application' in postgraduate trainees. This suggests that experiential learning may play a crucial role in reinforcing VBC-related attitudes and behaviors as students transition into clinical practice. The comparatively weak correlation between 'Attitude', 'Senior', and 'Teacher' norms with 'Application' scores suggests that while these elements are foundational, they may not directly translate into practical application without the intervening steps of perception formation and intention development.

In the univariate analyses, the presence of family members with chronic diseases emerged as a significant predictor for higher VBC application scores among sixth-year students, potentially indicating how personal experiences shape their willingness to engage with VBC practices. This finding, novel in our study, warrants further exploration. It aligns somewhat with previous studies that suggest students who have cared for chronically ill family members may experience significant physical, mental, and social consequences, which can enhance their patient-centered perspective [24, 25]. To optimize VBC in undergraduate education, medical curricula should formally incorporate structured, inter-departmental, and longitudinal concepts focusing on patient-centered training [26, 27].

Conversely, a secure family socioeconomic status was significantly associated with higher application scores among postgraduate trainees, suggesting that financial stability may influence confidence and ability to apply VBC principles in clinical settings. It is noteworthy as it implies that financial management skills and perceptions of value may be important factors in the application of VBC behavior among postgraduate trainees. However,

Table 3 Univariate analysis of factors related to value based care application score among Sixth-Year medical students

Factor	Group	Application Score	SD	*p*-value
Gender	Female	38.42	7.06	0.83
	Male	38.00	5.18	
Underlying disease	Yes	41.67	7.64	0.49
	No	37.97	6.25	
Family members with chronic disease	Yes	40.24	4.81	0.04*
	No	35.94	7.21	
Family net income	10,000 – 50,000 baht	39.50	5.71	0.70
	50,000 – 100,000 baht	37.60	6.60	
	> 100,000 baht	39.33	6.65	
Perceived family socioeconomic status	Secure	39.27	6.45	0.54
	Non secure	37.86	6.36	
Health coverage scheme	Universal coverage scheme	38.63	6.05	0.66
	Government officer	36.29	8.42	
	Others	39.50	0.71	
Level of education	High school	36.75	3.77	0.48
	Bachelor's degree	38.43	6.58	
Study program	General program	38.25	7.28	1
	Rural doctor program	38.26	6.02	

Note: SD = standard deviation, * p-value < 0.05, #non-secure perception of family socioeconomic status means not sure or insecure

Table 4 Univariate analysis of factors related to value based care application score among postgraduate trainees

Factor	Group	Application Score	SD	*P*-value
Gender	Female	41.00	6.00	0.86
	Male	41.32	6.32	
Underlying disease	Yes	39.29	5.50	0.38
	No	41.41	6.15	
Family members having chronic illnesses	Yes	40.19	6.15	0.27
	No	42.08	5.93	
Family net income	10,000 – 50,000 baht	38.08	6.72	0.09
	50,000 – 100,000 baht	42.95	5.71	
	> 100,000 baht	41.11	5.49	
Perceived family socioeconomic status[#]	Secure	44.82	3.03	0.003*
	Non secure	39.26	6.37	
Health coverage scheme	Universal coverage scheme	42.73	4.61	0.29
	Social security scheme	41.10	6.11	
	Government officer	38.69	7.30	
	Others	43.50	4.42	
Working experience after graduation	< 1 year	45.00	3.16	0.06
	1 – 3 years	41.58	5.70	
	> 3 years	38.43	6.87	
Community experience[+]	< 1 year	41.94	5.57	0.37
	1 – 3 years	39.77	4.69	
	> 3 years	38.50	12.56	

Note: SD = standard deviation, * p-value < 0.05, #non-secure perception of family socioeconomic status means not sure or insecure, +Working experience in community hospital after graduation

the association remains unclear and requires further exploration. Nevertheless, this finding aligns with existing studies suggesting that postgraduate courses should address issues related to money management [28, 29].

Multiple regression analysis further confirmed the role of personal and psychological factors in VBC application. For sixth-year students, the continued significance of family members with chronic diseases underscores the importance of personal connections to healthcare challenges. Perception, intention, and socioeconomic security emerged as strong predictors of VBC application scores among postgraduate trainees, suggesting the increasing influence of internal motivations and understanding of the healthcare environment as medical trainees progress

Table 5 Multiple linear regression model assessing predictors of VBC application score separately for Sixth-Year medical students and postgraduate trainees

Group	Factors	Intention score	
		Coefficient (95% CI)	*p*-value
Sixth-year medical students	Perception score	0.42 (-0.06,0.9)	0.087
	Intention score	0.32 (-0.07,0.71)	0.101
	Present vs. absent family member with chronic disease	4.32 (0.69,7.94)	**0.021***
Postgraduate trainees	Perception score	0.32 (0.10, 0.54)	**0.005***
	Intention score	0.42 (0.10, 0.73)	**0.011***
	Secure vs. non-secure perception of family socioeconomic status[#]	4.33 (1.69, 6.97)	**0.002***

Note: *p-value < 0.05

CI = confidence interval

[#]non-secure perception of family socioeconomic status means not sure or insecure

in their education and experience. This resonates with previous studies that suggest developing curricula related to VBC should consider differences between undergraduate and postgraduate levels [12, 13, 30]. For instance, undergraduate education may benefit from integrating VBC with related health policies, ethics, epidemiology, and social medicine, utilizing a case-based pedagogical style, such as case-based learning [12], while postgraduate education may focus on higher-level VBC skills such as low-value practices and cost-value care [13].

While the difference in VBC application scores between sixth-year students and postgraduate trainees was statistically significant, it also offers meaningful insights for curriculum development. The findings suggest a developmental progression in the application of value-based care, with postgraduate trainees—who have greater clinical responsibility—demonstrating more practical use of VBC principles. Importantly, these suggestions are aligned with Thailand's recent Medical Competency Assessment Criteria for National License (Announcement No. 4/2567), which, as of 2024, includes HSS and VBC as core competencies for undergraduate students [31]. This policy shift provides an opportunity for educators to incorporate structured approaches to VBC earlier in training. Compared to Western contexts—where collaborative learning and open communication support VBC adoption—Thai medical education may benefit from tailored strategies that gradually address institutional and cultural teaching norms to enhance the practical adoption of VBC.

Implications for practice and further research

The implications of our findings for medical education are substantial. To bridge the gap between theoretical knowledge and practical application, curricula should incorporate case-based learning (CBL) with real-world VBC scenarios to enhance decision-making and simulation-based training for hands-on experience in cost-conscious patient care. Additionally, narrative scenario-based empathetic simulations can provide students with exposure to practical VBC implementation, reinforcing clinical decision-making skills. To strengthen patient-centered care, integrating patient perspectives and shared decision-making exercises into training may enhance students' understanding of VBC's real-world impact.

For postgraduate trainees, financial literacy training covering healthcare cost evaluation, economic stability, and resource management could support better VBC application in clinical settings. From a policy perspective, our study underscores the necessity for national medical education standards in Thailand to explicitly include Value-Based Care principles. Policymakers should consider mandating structured VBC training programs across all medical schools, ensuring that graduates are uniformly equipped to deliver patient-centered, cost-effective care. Additionally, institutional policies should encourage regular assessment and ongoing development of VBC competencies among trainees and early-career physicians.

Future studies should explore the effectiveness of these strategies through longitudinal studies, tracking the development of VBC competencies over time and evaluating how specific teaching methods influence knowledge retention and application. Expanding sample sizes and study durations will also help provide a more comprehensive understanding of factors influencing VBC adoption.

Strengths and limitations

Strengths of our study include its pioneering approach to understanding VBC application in medical education through behavior analysis. By integrating a conceptual model with an examination of personal factors, our research offers comprehensive insights that can significantly contribute to the enhancement of medical curricula, ensuring that they foster the practical application of VBC among students.

Our six-week data collection period, while ensuring data confidentiality and reducing social desirability bias,

inherently limited participant numbers. This concise timeframe, though aligned with the academic term and essential for focused data collection, restricted the potential breadth of the study. Our methodology remained rigorous, with a strict approach to testing hypotheses via multiple linear regression analysis.

The small sample size restricted the inclusion of certain variables in the multiple linear regression model, ensuring statistical validity but potentially limiting a more comprehensive analysis. Additionally, the self-selection of participants and the single-institution setting may affect the generalizability of findings beyond this study population. However, despite these limitations, our research provides valuable, context-specific insights into VBC education at Prince of Songkla University, offering a foundation for future multi-institutional studies.

Conclusions

Our study highlights the complex interplay of personal experiences, socioeconomic factors, and educational progression in shaping the application of VBC among future healthcare providers. By understanding these factors, our findings offer valuable insights for medical educators seeking to tailor educational interventions to foster deeper and more practical engagement with VBC principles.

Abbreviations

VBC	Value-based care
HSS	Health System Science
AIC	Akaike Information Criterion
VIF	Variance inflation factor
CI	Confidence intervals

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Author contributions

All authors made a significant contribution to the reported work. P.S., K.Sa., P.T., P.P., and S.T. designed the study and obtained research ethics approval; K.K., P.K., K.Su., and Th.W. collected the data; P.S., K.C., K.Sa., Te.W., and Ta.W., analysed the data; all authors interpreted the results, drafted, and revised the manuscript, and read and approved the final version of the manuscript.

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Data availability

The dataset analyzed in the current study is available upon request from the corresponding author. However, the questionnaire was developed in the Thai language and the corresponding author can translate it to English, but it is not intended for back-translation using standard methods. If it is to be used, it is important to ensure the validity and reliability for other languages.

Declarations

Ethics approval and consent to participate

This study was approved by the Human Research Ethics Committee (HREC), Faculty of Medicine, Prince of Songkla University, on December 13, 2022. (Approval Number: REC 65-451-9-1). HREC is an official institute responsible for the ethical review and supervision of human research. The study was conducted in accordance with the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Consent to participate

All participants and/or their legal guardian(s) provided electronic informed consent before participating in the study, in accordance with established procedures. All questionnaires were fully computerized by the researchers and anonymized to ensure confidentiality.

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