

Exploring Behavioral Intentions In Holistic Medical Education Among Clinical Preceptors And Nurses Of The Post-Graduate Year: A Theory Of Planned Behavior Perspective

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Abstract

Background: Holistic medical education plays a critical role in developing nursing competencies; however, limited studies have simultaneously examined both clinical preceptors and postgraduate year nurses (NPGYs).

Objective: This study applied the Theory of Planned Behavior to compare determinants of behavioral intention toward holistic medical education between preceptors and NPGYs.

Methods: A cross-sectional survey was conducted from April to May 2020 using structured questionnaires. A total of 162 valid responses were analyzed. Exploratory factor analysis and multiple linear regression were performed using IBM SPSS Statistics.

Results: Perceived behavioral control was the strongest predictor of behavioral intention among both preceptors ($p < 0.001$) and NPGYs ($p < 0.001$). Attitude was additionally associated with behavioral intention among NPGYs, whereas subjective norms were not significant predictors in either group.

Conclusions: Perceived behavioral control plays a central role in shaping behavioral intention toward holistic medical education. Enhancing institutional support, teaching resources, and training opportunities may strengthen the implementation of holistic medical education in clinical settings.

Keywords: preceptor, postgraduate year nurse (NPGY), holistic medical education, theory of planned behavior

1. Introduction

The World Federation for Medical Education emphasizes continuous medical education, advocating for the seamless integration of pre- and post-graduation phases to foster lifelong professional development [1, 2]. In response, Taiwan's Ministry of Health and Welfare has implemented a structured postgraduate clinical training system to link theoretical knowledge acquired during schooling with practical clinical skills. This system is designed to cultivate core competencies, enhance independent caregiving skills, ensure medical service quality, and promote holistic medical education [3].

Since 2011, Taiwan's Accreditation of Task Indices for Medical Centers has mandated holistic medical education as a cornerstone of medical education [4]. Holistic medical education shifts the focus from traditional, medically centered approaches to human-centered care, enhancing clinical proficiency and reinforcing a commitment to patient-centered services [5]. The clinical setting serves as the primary venue for holistic medical education, supported by robust curriculum planning, teaching resources, and training programs, thereby nurturing a humanistic ethos among clinical educators and trainees [6].

The Theory of Planned Behavior (TPB) has been extensively validated across various disciplines, including healthcare research [7]. Relevant studies have explored barriers to incident reporting among nursing staff [8], interventions to improve breastfeeding outcomes [9], and factors influencing compliance with standard precautions among nursing students [10]. Additionally, studies have examined the role of attitudes, subjective norms, and perceived behavioral control (PBC) in healthcare professionals' intentions regarding oral hygiene care [11], empirical management [12], and perioperative patient safety [13].

Despite these advances, existing studies on holistic medical education and clinical teacher training have several limitations. First, most prior research has primarily focused on preceptors or clinical educators, while the perspectives of nurses in their post-graduate year (NPGYs), who are key recipients and implementers of holistic medical education in clinical settings, have been largely overlooked. This single-perspective approach may limit a comprehensive understanding of how holistic medical education is perceived and enacted across different professional roles.

Second, although the Theory of Planned Behavior (TPB) has been widely applied in healthcare-related behavioral research, its use in the context of holistic medical education—particularly in comparing different professional groups within the same educational system—remains limited. Many studies have examined individual components of behavioral intention in isolation, without systematically comparing how attitudes, subjective norms, and perceived behavioral control may function differently between educators and trainees.

Finally, prior studies have rarely examined holistic medical education within real-world clinical training environments using an integrated analytical framework that simultaneously considers organizational context, educational roles, and behavioral intention. As a result, empirical evidence informing targeted strategies for improving holistic medical education practices in teaching hospitals remains insufficient.

The significance of nurses' intentions in holistic care cannot be overstated, as evidenced by studies demonstrating the positive impact of intentions on patient care outcomes [14–16]. For instance, Zolfaghari et al. [14] found that nurses' intentions to practice therapeutic touch improved patient outcomes. At the same time, Hsieh, Lee, and Wen [17] highlighted the influence of attitudes and self-efficacy on workplace safety practices among student nurses. Lin and Chuang [18] further demonstrated that self-efficacy and related psychological factors significantly influence behavioral intention among nursing staff. These findings underscore the importance of examining behavioral intentions as a key mechanism for promoting effective clinical practices.

To address the aforementioned limitations in prior research, this study integrates the perspectives of both preceptors and NPGYs in a teaching hospital in Taiwan. By applying the Theory of Planned Behavior, this study examines how attitudes, subjective norms, and perceived behavioral control influence behavioral intentions toward practicing holistic medical education. The findings aim to inform targeted improvement strategies for holistic medical education, thereby enhancing clinical competencies, patient care quality, and nursing education practices, and contributing to the cultivation of nursing staff capable of providing comprehensive and patient-centered care.

2. Methods

2.1 Study Objective

This study aimed to compare whether the intentions of preceptors and NPGYs toward holistic medical education differ and to further reflect on the hospital's in-practice training course for clinical nursing teachers.

2.2 Study Subjects

This cross-sectional study used structured questionnaires to collect data between April 1 and May 31, 2020. The study participants

consisted of all preceptors who were employees and nurses of the post-graduate year (NPGYs) in the nursing department of a teaching hospital in Taiwan. The inclusion and exclusion criteria were applied to ensure a consistent, reliable, and objective study population. The first page of each questionnaire included an informed consent statement and explanatory information, and participation was entirely voluntary.

According to data from the hospital's human resource office, a total of 185 eligible preceptors and NPGYs were identified. Using purposive sampling, all eligible participants were invited to take part in the study, with particular attention to ensuring adequate representation of NPGYs. The researchers personally distributed paper-based questionnaires to potential participants, explained the study objectives and procedures, and obtained informed consent before participation. Completed questionnaires were collected on-site by the researchers to ensure data completeness and confidentiality.

A total of 164 questionnaires were returned, of which 162 were valid after excluding incomplete responses, resulting in a response rate of 87.5%. This study was approved by the Institutional Review Board of Show Chwan Memorial Hospital (Approval No. 1090203), and administrative permission to conduct the study was obtained from the hospital before data collection.

2.3 Measurement

The self-developed questionnaire used in this study included personal demographic data and scales measuring attitudes, subjective norms, PBC, and behavioral intention in medical education. Personal demographic data encompassed sex, age, education level, marital status, clinical teaching qualifications, professional title, and years of service. The questionnaire was developed based on previous studies and focused on four main constructs: attitude (e.g., 'I believe holistic medical education is valuable.'), subjective norms (e.g., 'International trends emphasizing the importance of holistic care would make me inclined to teach or learn courses in holistic medical education.'), PBC (e.g., 'I find teaching or learning courses in holistic medical education enjoyable.'), and behavioral intention (e.g., 'The Taiwanese government's promotion of holistic care would lead hospitals to arrange for me to teach or learn courses in holistic medical education.'). Each item was rated on a five-point Likert scale, where participants indicated their agreement levels from 1 (completely disagree) to 5 (completely agree).

For each construct, higher scores represented more positive attitudes toward holistic medical education, stronger perceived subjective norms, greater perceived behavioral control, and stronger behavioral intention to engage in holistic medical education practices. Lower scores indicated less favourable perceptions or weaker behavioral intention. Therefore, higher mean scores across the scales reflect stronger endorsement and readiness to participate in holistic medical education.

A panel of experts reviewed the initial questionnaire to ensure content validity, and items were revised accordingly. The average content validity index (CVI) was 0.908.

Exploratory factor analysis (EFA) was conducted to identify the underlying structure of the questionnaire and to classify items into constructs. Based on the EFA results, items were grouped into attitude (A1–A5, A6, A8, A9, A12), subjective norms (A10–A11), perceived behavioral control (A14–A20), and behavioral intention (B2–B7).

Internal consistency reliability was assessed using Cronbach’s α , with values greater than 0.7 indicating acceptable reliability [19].

Composite reliability (CR) and average variance extracted (AVE) were calculated to evaluate construct reliability and convergent validity. While CR values greater than 0.6 are considered acceptable, AVE values above 0.5 are generally recommended to indicate adequate convergent validity. In this study, the AVE for subjective norm was below the recommended threshold, suggesting potential limitations in the convergent validity of this construct [20–22]. A full list of questionnaire items is provided in Appendix A.

2.4 Data Analysis

Data analysis was performed using IBM SPSS Statistics version 21.0. Exploratory factor analysis (EFA) was conducted to examine the underlying structure of the questionnaire and assess construct validity. The suitability of the data for factor analysis was evaluated using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett’s test of sphericity. A KMO value greater than 0.6 and a significant Bartlett’s test ($p < 0.05$) indicated that the data were appropriate for factor analysis. Principal component analysis with varimax rotation was used to extract factors. Factor loadings greater than 0.4 were considered

acceptable. Internal consistency reliability was assessed using Cronbach’s α , with values greater than 0.7 indicating satisfactory reliability. Descriptive statistics were used to summarize participant characteristics. Independent samples t-tests were conducted to compare differences between preceptors and NPGYs. Multiple linear regression analysis was performed to identify predictors of behavioral intention in each group. Variance inflation factor (VIF) values were used to assess multicollinearity. The Chow test was applied to examine whether the regression models differed significantly between preceptors and NPGYs.

3. Results

In this study, 185 questionnaires were distributed to the preceptors and NPGYs in the nursing department, and 164 were returned. After eliminating two invalid questionnaires, the remaining questionnaires were used in this study, and the valid response rate was 87.5%. **Table 1** presents the analysis of basic personal data. Among the 162 questionnaires, 106 were from preceptors (65.4%), and 56 were from NPGYs (34.6%); 157 were from women (96.9%), and five were from men (3.1%). A total of 65 subjects were aged > 40 years (40.1%). A majority of subjects were college graduates (77.2%), and 98 of 162 were unmarried (60.5%). Half of the subjects had 10 or more years of service experience (50%). This study used the chi-squared test to examine whether there was a difference between the preceptors and NPGY groups. The results exhibited significant differences in sex ($p = 0.004$), age ($p = 0.001$), education level ($p = 0.008$), marital status ($p = 0.001$), job tenure ($p = 0.001$), and job title ($p = 0.001$), where the significance level was set at a p -value < 0.05 (**Table 2**).

Table 1: The validity and reliability of the research questionnaire

Measure	Mean	S.D	Cronbach’s α	Composite Reliability	Average Variance Extracted
Attitude	4.12	.56	.969	.952	.714
Subjective norm	4.01	.63	.904	.599	.336
Perceived behavioral control	3.70	.68	.954	.909	.592
Behavior intention	3.75	.61	.952	.910	.629

Note: SD = standard deviation; CR = composite reliability; AVE = average variance extracted.

Table 2: Characteristics of the study population (n = 162)

Measure	Preceptor	%	NPGYs	%	All	%	p-value
Sex							.004
Female	106	65.4	51	31.5	157	96.9	
Male	0	0	5	3.1	5	3.1	
Age (years) Mean:35.9							.001
≤ 30	4	2.5	56	34.6	60	37.0	
31–40	37	22.8	0	0	37	22.8	

>40	65	40.1	0	0	65	40.1	
Education Level							.008
Associate degree	12	7.4	9	5.6	21	13.0	
Bachelor's degree	78	48.1	47	29.0	125	77.2	
Master's degree	16	9.9	0	0	16	9.9	
Marital status							.001
Single	42	25.9	56	34.6	98	60.5	
Married	64	39.5	0	0	64	39.5	
Job tenure (year)							.001
≤ 2	56	34.6	4	2.5	60	37.0	
3-10	0	0	21	13.0	21	13.0	
>10	0	0	81	50.0	81	50.0	
Job title							.001
Manager	66	40.7	56	34.6	122	75.3	
Nursing	40	24.7	0	0	40	24.7	

Note: Values are presented as frequency and percentage. Chi-square tests were used for group comparisons. Statistical significance was set at $p < 0.05$.

To discern the relationship between the variables, this study used the Pearson correlation coefficient to examine the degree of correlation between various dimensions. The results showed that (**Table 3**) the correlation coefficient (r) of attitude and subjective norms was 0.847

($r = 0.601$ for attitude and PBC and $r = 0.572$ for attitude and behavioral intention). There was a significant correlation between every two variables ($p = 0.001$).

Table 3: The Pearson correlation analysis

Measure	1	2	3	4
1-Attitude	.845			
2-Subjective norm	.847***	.580		
3-Perceived behavioral control	.601***	.657***	.769	
4-Behavior intention	.572***	.574***	.723***	.793

Note: *** $p < 0.001$. Diagonal values represent the square root of AVE; off-diagonal values represent correlation coefficients. However, the subjective norm construct demonstrated relatively low convergent validity (AVE = 0.336), and its square root of AVE was lower than its correlations with other constructs, indicating potential issues with discriminant validity.

3.1 Differences in the behavioral intentions of preceptors and NPGYs in medical education and their correlation

This study used the t-test method to explore whether there was a difference between the behavioral intentions of preceptors and NPGYs in medical education. The results showed that there was no significant difference in attitude ($p = 0.910$), subjective norms ($p =$

0.907), PBC ($p = 0.152$), and behavioral intention ($p = 0.290$) between the two groups (see **Table 4** for details of the differences between the behavioral intentions of preceptors and NPGYs in medical education).

Table 4: The differences between the behavioral intentions of preceptors and NPGYs in medical education

Measure	Preceptor		NPGYs		P value (t test)
	Mean	S.D	Mean	S.D	
1-Attitude	4.123	.580	4.113	.529	.910
2-Subjective norm	4.004	.630	4.009	.629	.907
3-Perceived behavioral control	3.650	.703	3.804	.614	.152
4-Behavior intention	3.714	.634	3.818	.571	.290

Note: Values are presented as mean $\pm$ standard deviation (SD). Independent samples t-tests were used for group comparisons. Statistical significance was set at $p < 0.05$.

This study further used the regression model to compare and analyze the influence of preceptors and NPGYs on behavioral intentions in medical education. First, the variance inflation factor (VIF) and condition index (CI) were used to measure the degree of multicollinearity between variables, where a VIF value < 10 and a CI value < 10 indicate that there is no problem of multicollinearity in the analysis. Then, the Chow test, a method of testing in econometrics, was used to examine whether the parameters (e.g., slope and intercept) of different variables and linear regression coefficients of two different data groups were the same [23]. Thus, the Chow test was

used in this study to determine whether there was any difference in behavioral intentions in medical education between preceptors and NPGYs. The result concerning their behavioral intentions in medical education, examined by regression analysis, was $F = 34.615$ ($=0.001$), indicating a significant difference. From the regression model in **Table 5**, the regression results indicated that perceived behavioral control was a significant predictor of behavioral intention in both preceptors and NPGYs ($p < 0.001$). In addition, attitude was marginally associated with behavioral intention among NPGYs.

Table 5: Regression and Chow test analysis (n=162)

Measure	Behavior intention	
	Preceptor	NPGYs
Attitude	.195	.072*
Subjective norm	.450	.313
Perceived behavioral control	.001***	.001***
R ²	.583	.490
Adjusted R ²	.570	.460
F value	47.476	16.664
P value	.001***	.001***
Chow test: $F = 34.615$ ($p < 0.001$)		

Note: Values represent standardized regression coefficients (β). * $p < 0.05$; *** $p < 0.001$.

4. Discussion

Many previous studies have examined training courses for clinical teachers from the perspective of clinical teachers [24, 25], whereas very few have evaluated holistic medical education from the perspectives of preceptors and NPGYs. This study drew on preceptors' teaching experiences and NPGYs' learning experiences to reflect on holistic medical education and suggest improvement measures for its further roll-out.

Recent studies have also emphasized the importance of behavioral and educational factors in shaping nursing competencies and training outcomes in clinical settings [26]. In addition, the Theory of Planned Behavior has been widely applied in nursing education to explain behavioral intentions and professional development [27].

According to this study's findings, perceived behavioral control (PBC) was the primary factor influencing the behavioral intentions of both preceptors and NPGYs in holistic medical education. Ajzen's [28] theoretical assumption that PBC has both a direct effect on behavior and an indirect effect through behavioral intention was partially supported. In addition, attitude was found to influence behavioral intention among NPGYs, which is partially consistent with prior findings [29].

Previous studies have suggested that behavioral intention is jointly determined by attitude, subjective norms, and PBC [28, 30]. However, in the present study, subjective norm did not emerge as a significant predictor of behavioral intention. This finding should be interpreted with caution. The relatively low average variance extracted (AVE =

0.336) indicates limited convergent validity, suggesting that the construct may not have been adequately captured by the measurement items. As such, the non-significant result may reflect measurement limitations rather than a true absence of normative influence. Future research should refine the operationalization of subjective norm and explore its role using more robust measurement frameworks.

Although a relatively high correlation was observed between attitude and subjective norms, these constructs remain conceptually distinct within the Theory of Planned Behavior, representing personal evaluation and perceived social influence, respectively.

In our study, the influencing factors with regard to PBC while executing holistic medical education were the ability to control resources in need and opportunities and other nonmotivational factors that cannot be controlled by individuals, such as time, skills, abilities, and policies. In terms of time, given that most nursing staff work in shifts, the holistic medical education courses provided by this hospital have a flexible schedule and are available online, which are conducive to learning. In terms of skills, Von [31] pointed out that medical staff-patient communication in holistic medical education contexts could be improved by several measures that focus on the process of reflection and feedback on students. These measures include the use of social interaction and scenarios by teachers, the use of a mentoring approach to help students establish their knowledge and skills, and the use of teacher-student dialogue to identify the cognitive problems in students [31]. Through the process of producing reflection and

feedback, students can further improve their staff–patient communication ability within holistic medical education contexts. Moreover, Bradley and Postlethwaite [32] stated that, due to the information explosion and technological advancement, teaching methods of medical education have also changed, including various teaching theories, such as behaviourism, reflective practice, situated learning, activity theory, constructivism, and social constructivism [33]. Therefore, it is recommended that constructivism be used in the introduction of holistic medical education and that preceptors' medical knowledge and skills be integrated to cultivate NPGYs' staff–patient communication ability within holistic medical education contexts.

In terms of ability, teaching hospitals are suitable places to apply constructivist teaching to holistic medical education because, besides NPGYs, there are also nursing students from different schools. However, due to the lack of interaction with real patients, even though students have received good medical knowledge and simulation exercises, it is difficult for them to acquire communication and interaction skills with patients in real clinical settings. Therefore, it is necessary to deliver courses alongside real cases in the clinical setting and add affective domain teaching and NPGY skills support to the course to enhance NPGYs' learning ability. Therefore, the provision of an environment that is sufficient in terms of teaching resources for preceptors and NPGYs can promote their behavioral intentions to participate in holistic medical education. Furthermore, with regard to policy, an aspect of utmost importance, Lin et al. [6] reported that hospitals should provide enough incentives, such as funds and rewards, to support holistic medical education. Thus, the policy should be in Favor of making preceptors and NPGYs believe that the course contents are beneficial to patients and are supported by the hospital leaders and policies.

In addition, the educational beliefs of medical educators influence their teaching practices. Good teaching outcomes depend on the application of appropriate teaching models and multiple teaching strategies. Clinical nursing teaching in hospitals should eventually be evaluated based on the trustworthy practice of holistic medical education and through cross-field team cooperation to solve patients' problems. This approach will truly show the result of holistic medical education and improvement of professional nursing ability and strengthen the practicality of training courses for clinical nursing teachers. It is beneficial to incorporate concrete examples or case studies that demonstrate successful implementation of these measures. For instance, case hospitals receive positive feedback on holistic medical education from clinical faculty and students through educational incentives and the design of learning frameworks. It is hoped that the results of this study can provide a reference for hospitals while planning training courses for their clinical nursing teachers.

Finally, these studies provide concrete examples that enhance our understanding of the challenges and opportunities in nursing

education, including compassionate care challenges [34], research on different teaching methods in nursing education [34], and barriers to utilizing research findings to improve nursing care [15]. By incorporating these real-life examples into the discussion, we can make the findings of this study more tangible and practically meaningful, while also providing valuable references to aid in future planning of clinical nursing teacher training courses.

Additionally, the influence of hospital culture and leadership on the adoption and effectiveness of holistic medical education practices warrants further investigation. Understanding how these factors shape preceptors' and NPGYs' perceptions and behaviours may provide valuable insights into fostering a supportive environment for holistic medical education. Such considerations may contribute to the development of more effective training programs and the overall improvement of nursing education.

5. Conclusion

The findings of this study highlight the critical importance of addressing key factors to facilitate the effective implementation of holistic medical education. Through an analysis of perspectives from both preceptors and NPGYs, several crucial elements have been identified, shedding light on areas for improvement and enhancement in nursing education.

Primarily, the significant impact of PBC on the intentions of both preceptors and NPGYs underscores the necessity of providing adequate resources and support systems. Recognizing the pivotal role of factors such as time, skills, abilities, and policies in shaping behavioral intentions emphasizes the imperative for institutions to ensure tailored resources and support mechanisms for educators and learners.

Furthermore, addressing the challenges posed by the qualitative implementation of holistic medical education emphasizes the need to foster a hospital culture conducive to the values and principles of holistic education. This involves not only ensuring alignment of institutional policies and incentives with the objectives of holistic education but also cultivating an environment that values continuous learning and collaboration among stakeholders. The findings underscore the importance of integrating innovative teaching methodologies and strategies into clinical nursing education to meet the learning needs of NPGYs in holistic medicine.

Specific teaching models and strategies that could be effective based on the study's findings include:

1. **Problem-Based Learning (PBL):** This model encourages critical thinking and the application of knowledge in real-world scenarios, allowing NPGYs to develop problem-solving skills essential for holistic care.
2. **Simulation-Based Education:** Utilizing simulation training can provide hands-on experience in a controlled environment, enhancing clinical skills and preparedness for real patient

interactions.

3. **Mentorship Programs:** Establishing mentorship programs where experienced preceptors guide NPGYs can foster professional development and continuous learning.
4. **Constructivist Approaches:** Incorporating constructivist teaching strategies, such as reflective practice and collaborative learning, can help NPGYs integrate theoretical knowledge with practical application.
5. **Real-World Case Studies:** Integrating case studies into the curriculum can make learning more relevant and practical, helping NPGYs understand the complexities of patient care in a holistic context.

In addition to these strategies, educators' beliefs in patient-centered care and interdisciplinary collaboration significantly shape curriculum design and teaching methodologies in holistic medical education. These beliefs may manifest in the integration of case-based learning methods that emphasize empathy and comprehensive patient assessment. Moreover, educators who prioritize lifelong learning and reflective practice create environments where NPGYs feel supported in developing holistic care skills through ongoing mentorship and feedback. By leveraging these approaches, educators can significantly enhance the practicality and effectiveness of holistic medical education, equipping NPGYs with the essential skills needed for comprehensive patient care.

Lastly, to further enhance the effectiveness of holistic medical education, it is crucial to emphasize factors such as resource allocation, institutional support, and hospital culture. By addressing these elements—ensuring proper resource allocation, securing robust institutional support, and fostering a culture aligned with holistic principles—institutions can facilitate meaningful progress in nursing education. This, in turn, will improve patient care and promote the professional development of healthcare professionals.

In conclusion, the findings of this study underscore the importance of addressing key factors such as policy frameworks, technological advancements, and institutional support to facilitate the effective implementation of holistic medical education in nursing. By exploring the policy implications of our findings and harnessing technological advancements, institutions can enhance their curriculum development strategies and better prepare healthcare professionals for patient-centered care within holistic medical education. Moreover, understanding the impact of hospital culture and leadership on holistic medical education can further enrich our approach to developing comprehensive and effective training programs. Future research should continue to explore alternative behavioral models alongside TPB and examine the interplay between institutional factors and educational practices to foster a more supportive environment for holistic medical education.

Limitations

The findings of this study should be interpreted in light of several limitations. First, the subjects were restricted to preceptors and NPGYs from a single teaching hospital in Taiwan, which may limit the generalizability of the results to a broader population of nursing professionals. While this study aimed to provide insights into holistic medical education training, including participants from multiple centers could have strengthened the generalizability of the findings. Additionally, the evaluation of the training course was conducted solely through a quantitative research approach, potentially overlooking qualitative nuances and experiential insights that could have been captured through a mixed-methods approach.

Second, while the Theory of Planned Behavior (TPB) offers valuable insights into factors influencing intention and behaviour, its application in this study may have been somewhat generalized. Future research should explore more diverse and nuanced factors influencing individualized support in nursing education, considering potential differences across institutions and healthcare settings. Moreover, the lack of experimental validation for the hypothesized relationships within the TPB, as noted by Jonas and Doll [32], highlights the need for further empirical investigation to strengthen the theoretical underpinnings of the study.

Third, the data used in this study were collected in 2020. Changes in healthcare education policies and clinical training environments in recent years may affect the applicability of the findings. Therefore, the results should be interpreted with caution.

Finally, the measurement of the subjective norm construct demonstrated relatively low convergent validity ($AVE = 0.336$) and potential issues with discriminant validity. This limitation suggests that the instrument may not have fully captured the intended construct, which may have influenced the non-significant findings related to subjective norm. Future research should refine and validate this construct using more robust measurement approaches.

Recommendations For Future Research

Future research should address the identified limitations to advance nursing education. Incorporating a diverse sample from multiple hospitals and healthcare settings using a mixed-methods approach would enhance the study's applicability and depth. This approach combines quantitative analysis with qualitative insights to comprehensively explore the complex dynamics in holistic medical education. Additionally, experimental studies are needed to validate the TPB and explore alternative behavioral models. Understanding how hospital culture and leadership influence preceptors' and NPGYs' perceptions and expectations of holistic medical education is crucial. This exploration will provide insights into developing effective training programs aligned with institutional policies and holistic care principles, ultimately improving patient care and enhancing healthcare professionals' professional development.

Implications For Nursing Management

In addition to improving preceptors' holistic professional skills, teaching resources, and policy support, future research should explore the policy implications of our findings for nursing education. Specifically, examining how institutional policies can support the implementation of holistic medical education across various healthcare settings would be beneficial. This could include developing standardized curricula, policy frameworks that incentivize participation in holistic education, and guidelines for integrating holistic care principles into existing nursing education programs.

Furthermore, leveraging technological advancements and the information explosion presents opportunities to enhance holistic medical education. Integrating digital platforms for virtual simulations, online modules for continuous learning, and telemedicine technologies can expand access to holistic medical education training beyond traditional classroom settings. These technologies not only enhance the practicality of training but also prepare NPGYs to navigate the complexities of patient-centered care within holistic medical education in modern healthcare environments. By addressing these aspects, institutions can enhance their curriculum development strategies and better prepare healthcare professionals for patient-centered care within holistic medical education.

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Ethics Approval

This study adheres to the guidelines of the Declaration of Helsinki. This study was reviewed and approved by the Institutional Review Board of Show Chwan Memorial Hospital with approval number 1090203, dated March 18, 2020. Prior to data collection, the research team personally engaged with each participant to obtain informed consent. During these interactions, the researchers meticulously

elucidated the study's objectives and procedures, ensuring comprehensive comprehension on the part of the participants. Participants were afforded ample opportunity to pose inquiries and seek clarification, fostering a transparent and informed decision-making process. By directly interfacing with participants, the researchers aimed to bolster transparency and facilitate a robust understanding of the study, thereby upholding ethical standards in research conduct.

Data Availability Statement

Data cannot be made publicly available owing to the fact that the privacy of individual participants cannot be compromised. However, the dataset is available from the corresponding author on reasonable request.

Credit Authorship Contribution Statement

Liang-Hsi Kung: Writing-original draft, Project administration.

Yu-Hua Yan: Writing-review & editing, Supervision, Project administration, Conceptualization.

Declaration Of Competing Interest: The authors declare no conflict of interest.

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Ethical Approval Statement

This study was approved by the Institutional Review Board of Show Chwan Memorial Hospital (IRB No. 1090203). All participants provided written informed consent prior to enrolment in the study. This research was conducted ethically in accordance with the World Medical Association Declaration of Helsinki.

Author Contributions

Study conception and design: YHY; Data collection: YCT; Data analysis and interpretation: YHY; Drafting of the article: YCT; Critical revision of the article: YHY, YCT

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Appendix A. Questionnaire Items

All items were measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

A. Attitude

- A1. I believe holistic medical education is valuable.
- A2. I believe holistic medical education is meaningful.
- A3. Holistic medical education allows me to take on new challenges.
- A4. Holistic medical education enhances my professional knowledge.
- A5. Holistic medical education improves my teaching/learning ability.
- A6. Holistic medical education enriches my teaching/learning career.
- A8. International trends emphasizing holistic care motivate me to engage in holistic medical education.
- A9. Government promotion of holistic care motivates me to engage in holistic medical education.
- A12. I consider holistic care important, which motivates me to engage in holistic medical education.

B. Subjective Norms

- A10. Hospital promotion of holistic care encourages me to engage in holistic medical education.
- A11. Accreditation requirements for holistic care encourage me to

engage in holistic medical education.

C. Perceived Behavioral Control

- A14. I find participating in holistic medical education enjoyable.
- A15. I feel happy engaging in holistic medical education.
- A16. I consider engaging in holistic medical education easy.
- A17. I can easily obtain support when encountering difficulties.
- A18. I am able to allocate time to participate in holistic medical education.
- A19. I have sufficient resources to engage in holistic medical education.
- A20. I have sufficient knowledge to effectively engage in holistic medical education.

D. Behavioral Intention

- B2. I am capable of engaging in holistic medical education.
- B3. I intend to engage in holistic medical education in the future.
- B4. I will try to engage in holistic medical education in the future.
- B5. I plan to engage in holistic medical education.
- B6. I am willing to participate in training related to holistic medical education.
- B7. I am willing to invest effort in holistic medical education to improve my professional competence.