

ความรู้ เจตคติ และการปฏิบัติของนิสิตพยาบาลไทยกับการเรียนพยาบาล ในช่วงการระบาดของโควิด-19: การศึกษาแบบผสมผสาน

Knowledge, Attitude and Practice of Nursing Students in Their Study during the Covid-19 Pandemic: A Mixed Method Study

นิพนธ์ต้นฉบับ

Original Article

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บทคัดย่อ

วัตถุประสงค์: เพื่ออธิบายความสัมพันธ์ของแนวคิดความรู้ เจตคติ และการปฏิบัติ (KAP) ในนิสิตพยาบาลระดับปริญญาตรีเกี่ยวกับการรับรู้และประสบการณ์ที่เกิดขึ้นในช่วงการแพร่ระบาดของโควิด-19 **วิธีการศึกษา:** การศึกษาวิจัยแบบผสมผสาน รวบรวมข้อมูลในมหาวิทยาลัยแห่งหนึ่งของประเทศไทยในปี พ.ศ. 2564 โดยใช้แบบสอบถามออนไลน์ ในนิสิตพยาบาลระดับปริญญาตรี (n = 161) ซึ่งแบบสอบถามได้รับการพัฒนาผ่านการทบทวนวรรณกรรม วิเคราะห์ข้อมูลโดยใช้ค่าสัมประสิทธิ์สหสัมพันธ์ของสเปียร์แมนหรือเพียร์สันระหว่างความรู้ (K) ทักษะ (A) และการปฏิบัติ (P) และลักษณะทางประชากรศาสตร์ สัมภาษณ์แบบกึ่งโครงสร้าง (n = 13) จนข้อมูลอิ่มตัว วิเคราะห์เนื้อหาแบบอุปนัยเพื่ออธิบายผลการศึกษาจากแบบสอบถาม **ผลการศึกษา:** ความรู้สัมพันธ์กับทัศนคติ ($r_{\text{Spearman}} = 0.234$, P-value < 0.01) แต่ความรู้ (K) ไม่สัมพันธ์กับการปฏิบัติ ทักษะสัมพันธ์เชิงลบกับการปฏิบัติ ($r_{\text{Pearson}} = -0.207$, P-value < 0.01) อายุ ($r_{\text{Spearman}} = 0.201$, P-value < 0.05) และชั้นปีที่ศึกษา สัมพันธ์กับความรู้ ($r_{\text{Spearman}} = 0.234$, P-value < 0.01) ที่อยู่อาศัยสัมพันธ์ผกผันกับการปฏิบัติ ($r_{\text{Pearson}} = -0.190$, P-value < 0.05) ข้อมูลจากการสัมภาษณ์เชิงลึกพบ 4 หัวข้อสำคัญ ได้แก่ 1) ไม่มีแหล่งที่เชื่อถือได้แหล่งเดียว (K) 2) สถานการณ์ที่เกิดขึ้นส่งผลกระทบต่อสุขภาพจิตของนิสิต (A) 3) นิสิตต้องตระหนักรู้ (A) และ 4) นิสิตได้ปรับตัวให้เข้ากับการเปลี่ยนแปลงสู่วิธีการเรียนรู้ และการปฏิบัติแบบใหม่ (P) สรุป: ความรู้เรื่อง COVID-19 สัมพันธ์กับทัศนคติอย่างมีนัยสำคัญ แต่ไม่สัมพันธ์กับการปฏิบัติ ซึ่งอาจเป็นผลจากการเปลี่ยนจากสถานที่และการขึ้นฝึกปฏิบัติจริงในสถานพยาบาลเป็นการเรียนในแพลตฟอร์มออนไลน์อย่างกะทันหัน การสัมภาษณ์เชิงลึกพบ 5 ประเด็นเพื่อพัฒนาการศึกษาของนิสิตพยาบาล ได้แก่ วิธีการใหม่ในการเข้าถึงผู้ป่วย, คู่มือการปฏิบัติงานที่ปลอดภัย, ปรับหลักสูตรให้ทันสมัยอยู่เสมอ, มีช่องทางออนไลน์ที่หลากหลาย, และจัดการศึกษาแบบผสมผสาน

คำสำคัญ: ความรู้, ทักษะ, การปฏิบัติ, นิสิตพยาบาลชั้นปริญญาตรี, โควิด-19, พยาบาลศึกษา

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Abstract

Objective: To describe an application of the correlation of knowledge, attitude, and practice (KAP) concepts amidst the COVID-19 pandemic among undergraduate nursing students on how they perceived and experienced it.

Methods: A mixed method design was used at a university in Thailand, in 2021. An online questionnaire survey among undergraduate nursing student (n = 161) was done. The questionnaire was developed through literature review. Spearman and Pearson correlation coefficients were used as appropriate to test correlation among KAP and demographic characteristics. Semi-structured interview was done in 13 participants. Once the data saturated, inductive content-analysis was performed. **Results:** Knowledge was significantly, positively correlated with attitude ($r_{\text{Spearman}} = 0.234$, P-value < 0.01) but not with practice. Attitude was significantly, negatively correlated with practice ($r_{\text{Pearson}} = -0.207$, P-value < 0.01). Age ($r_{\text{Spearman}} = 0.201$, P-value < 0.05) and years of study ($r_{\text{Spearman}} = 0.234$, P-value < 0.01) were significantly correlated with knowledge, whereas habitat was inversely correlated with practice ($r_{\text{Pearson}} = -0.190$, P-value < 0.05). The four categories namely 1) no single trust source (K), 2) negative impacts on the students' mental health (A), 3) one must be aware of (A), 4) adjustment to new ways of learning and doing (P) were revealed from interview data. **Conclusions:** Knowledge of COVID-19 during the provision of nursing studies was significantly correlated with attitude, but not with practice. This could be because a sudden shift from onsite and clinical placement to online platform. Five transformed aspects of nursing studies amidst crisis include new method to approach patient, safest practice guide, regularly updated course, varies online channels, and hybrid study.

Keywords: knowledge, attitude, practice, undergraduate nursing-students, COVID-19, nursing studies

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Introduction

The 2019 Coronavirus (COVID-19) and its many variants has rapidly disseminated throughout the world since its initial detection in November 2019, and to date has been responsible for many deaths and infections worldwide. COVID-19 has also been addressed to cause considerable amount of stress, fear, and worry among the people which has

elicited a lot of maladaptive responses such as anxiety, discrimination, and social stigma among the population.¹

The International Council of Nurses (ICN) agreed that nursing education has been disrupted throughout the COVID-19 pandemic. A delay in graduation due to cancellations of clinical placement or practice in restricted areas will lead to a

failure of new registered nurses flow and affect the future nursing workforce. A standard of nursing education and nursing students' competencies therefore predicted to impact on nursing role, and their professional identity.²⁻⁵

The concept of KAP provides the information on how people know about the certain things, how they feel about it, and guide them to change their behaviours.⁶ Global population had been observed on their knowledge, attitude, and practice during the COVID-19 outbreak. A meta-analysis study involved 45 countries reported that knowledge and attitude was positively correlated to practice, and it suggested a crucial message that our world needs actual knowledge to translate into preventive practice.⁷ Nursing students are not excepting, a South African study showed the knowledge of infection control among nursing students was correlated with positive attitude and practice.⁸ Certainly, nursing students are required to transfer their knowledge and skills into clinical practice and then translate this safely into their actions.⁹ During COVID-19, Belgian and Spanish nursing students indicated they had difficulties in applying infection control knowledge to clinical skills mainly due to unstructured and ambiguous information on competencies for infection control and safety monitoring. They revealed the feeling of insecure when on placement and accounts insufficiently supported by university faculty.^{10,11} A further compounding factor towards the knowledge-practice gap was a lack of opportunity for hands-on experience, a shortage of clinical nurse educators, outdated curriculum, and a paucity of real-world theoretical case scenarios for students to unpack.⁹ For many nursing students, their clinical placements were halted as a result. As a response, nursing students undertook online learning for the first time. Studies have identified for many students new to online learning, this resulted in a sense of overload from having new assignment formats, having to use unfamiliar online material, and no access to study spaces.^{12,13} Globally it has been identified in the literature nursing students during this time as being a stressful period^{12,14,15}, and low sense of coherence.¹⁶ This has been included for the Thai nursing students.

Thailand's nursing undergraduate education has been significantly affected by COVID-19. It is a university degree and requires nursing licensing examination after completing the course. This is a robust and holistic delivery of education for essential knowledge and practices, as well as the provision of clinical placements to gain experience, and to meet the national competencies for registration.¹⁷ The World Health

Organization (WHO) underpins five principles standards for nursing and midwifery initial education course which are the program of graduates, development/revision, curriculum, faculty, and admission.¹⁸ One of those standard demands nursing educations to prepare nursing profession to optimum health care outcomes in complex environment, which concerns health crisis and disaster such as the COVID-19 pandemic.¹⁹ Currently, specific knowledge and practice on the management of COVID-19 remains uncertain, and nursing education has been disrupted. How nursing students adjust to the impact of Covid-19 on their education is unclear. Subsequently, the application of the KAP model is considered to assist with improving knowledge, to then generate an improved attitude toward an individual's actions.²⁰ The KAP for nursing students on how they are able to minimize the impact of Covid-19 and yet still be able to perform with respect to continuing their nursing studies through COVID-19 has yet to be explored.

This cross-sectional mixed-methods study aimed to 1) assess the correlation within the KAP model amidst COVID-19 among undergraduate Thai nursing students, and 2) seek to provide explanation on how the course learners alike perceived their study in nursing within this situation. The results of this study could assist and fill the gaps of nursing education within the emerging disruption and shape the future nursing professional distinctiveness.

Methods

An explanatory sequential mixed method design was used for gathering data as per the principles of triangulation, complementarity, initiation, expansion, and development.²¹ This method began with a quantitative component before extrapolating qualitative findings.²² The six steps of data collection and interpretation as per Zheng²² and Ivankova, Creswell and Stick²³ were employed to guide the study. The steps of this study were 1) online survey 2) statistics data analysis 3) review for completeness 4) semi-structured interview 5) content analysis) and 6) triangulation of results.

Participants and recruitment

The self-administered online questionnaire survey population was calculated with the program G*Power 3.12. With an effect size of 0.3, a type I error of 5%, and a power of 95%, a minimum sample size of 134 participants was needed. To compensate for anticipated difficulties and

potential loss, a 20% was added to result in a final sample size of 161 participants. A convenience sampling as an unrestricted self-selected surveys²⁴ was employed among the first, second, third, and fourth-year nursing student at Srinakharinwirot University, Thailand.

To be eligible, participants had to be 18 years or older, enrolling in a full-time Bachelor of Nursing Course, and willing to participate. For the online semi-structured interview, the first participant was purposely selected, and then a snowball approach was used. Semi-structured interviews were undertaken with 14 students who did not anticipate the online survey. However, one student dropped out due to technical difficulties where the recording was the blackout, the total number was 13.

Research instruments

The questionnaire was initially developed and guided from a literature review on the Thai national regulation and

practices for COVID-19 by the Department of Disease Control, 2020.²⁵ Three panel experts including public health, nursing education, and communicable disease prevention had evaluated and validated the content. The questions were revised based on the expert recommendations. Content validity was acceptable with a Content Validity Index (CVI) of 0.83. Internal consistency reliability was tested with 30 individuals with characteristics comparable with the participants. Internal consistency reliability was tested through KR20 for the knowledge, and Cronbach's alpha coefficient was used for the attitude and practice. Knowledge questions were found to have acceptable internal consistency reliability with KR20 coefficient of 0.76, and questions of attitude and practice had borderline and acceptable reliability, respectively (Cronbach's **alpha** coefficients of 0.64 and 0.73, respectively).

Table 1 The KAP questionnaire questions during COVID-19.

KAP	Questionnaire questions
Knowledge (17 items)	1. COVID-19 can be transmitted from person to person by cough, sneeze, runny nose, and saliva.
	2. Patients with COVID-19 will have a fever along with respiratory symptoms such as coughing, sneezing, runny nose, and breathlessness.
	3. COVID-19 patients must stay and observe symptoms at the hospital or places provided by the state for all.
	4. Keeping a distance of less than 2 meters from others can prevent COVID-19.
	5. Wearing a mask when leaving the house can prevent COVID-19 disease.
	6. Touching your face, nose or mouth with your hands increases the risk of contracting COVID-19.
	7. Eating hot and use your own spoon can prevent infection with COVID-19
	8. Hand washing with soap or alcohol gel can reduce the infection of COVID-19
	9. A 14-day quarantine for people returning from high-risk areas can screen and assess COVID-19 infections.
	10. Changing masks, fabric masks and washing them every day prevents infection both from oneself and others.
	11. Changing the hygiene mask every day and disposing it in a covered container prevents infection both from oneself and others.
	12. Lifestyle of being 'new normal' can help to reduce the spread of COVID-19.
	13. Wearing a hygienic mask or fabric mask every time you leave the house is a lifestyle of being 'new normal.'
	14. Social distancing at least 2 meters is a lifestyle of 'new normal.'
	15. Frequent hand washing / carrying alcohol gel to wash your hands is a lifestyle of 'new normal.'
	16. Body temperature screening and hand washing with alcohol gel before entering the department stores, etc., is a lifestyle of 'new normal.'
	17. Teaching of the Faculty of Nursing through online media is a lifestyle of 'new normal'
Attitude (12 items)	1. Do you think that contracting coronavirus 2019 (COVID-19) is the same as contracting the flu?
	2. Do you think that when infected with COVID-19 treatment is the same as infection with the flu?
	3. Do you think that the government's announced in the Government Gazette Declare a state of emergency throughout the kingdom to control the spread of the coronavirus disease COVID-19, is helping to reduce the spread of the COVID-19?
	4. Do you think working from home will help reduce the rate of corona virus 2019 (COVID-19) infection?
	5. Do you think distance learning and online learning reduce the rate of infection of the COVID-19?
	6. Do you think distance learning and online learning is not a 'new normal'?
	7. Do you think that distance learning and online learning are changing the behaviour of teachers using technology, which is the 'new normal'?
	8. Do you think that distance learning is a change in management methods, and it is a "new normal" for teaching and learning in the nursing field?
	9. Do you think that online learning is an adaptation of educational management, and it is the 'new normal' that will occur in teaching and learning of nursing?
	10. Do you think online learning increases the burden of expenses for your parents and it still won't be a 'new normal'?
	11. Do you think that the nursing profession should manage teaching in the same way that is to focus on teaching in the classroom?
	12. Do you think that some practice learning can be taught online and classified as a 'new normal', which be adjusted to suit the epidemic situation of the COVID-19?
Practices (11 items)	1. When you must cough, sneeze and don't have toilet paper, you will be coughing and sneezing into the elbow by lifting one of the arms to catch the flow, and this to prevent the spread of COVID-19
	2. When you leave the house, you wear a mask every time.
	3. You carry alcohol gel for spraying hands, and you also wash hands often with soap.
	4. You did not touch your face, eyes, nose, or mouth with your hands.
	5. When sharing food with others, you use a personal serving spoon.
	6. You use your own glass of water.
	7. You change the mask every day and put it as rubbish in a covered container.
	8. You change the mask and wash it every day.
	9. You study through the online system.
	10. You must maintain a social distance of at least 2 meters when you go to a crowded area.
	11. During the COVID-19 outbreak, you stay at home.

Semi-structured interview questions were developed based on the quantitative results. These questions included five questions. One researcher (WP) conducted the semi-structured interview.

Table 2 The KAP semi-structured interview questions.

K	What is your understanding of COVID-19?
A	How has COVID-19 affected you? How do you feel about it?
P	How do you deal with it in your daily lives? How do you manage your study amid COVID-19?

Data collection procedure

The quantitative online survey was undertaken between April and June 2021. It was hosted on the student's learning platform and once the students had completed it, the real time data were downloaded into a spreadsheet. The online in-depth interviews (n = 14) were undertaken based on the participants preference, and included platforms such as Zoom, Google Meet, Line application, Facebook Messenger and Microsoft Teams. Each interview went for approximately 40 - 60 minutes. The interview data were collected from August to September 2021, and they were provided with the opportunity for member checking to confirm their voices had been captured.

Data analysis

The collected quantitative survey data were organized, tabulated, and statistically analyzed using IBM SPSS Statistics Desktop version 22.0, License: D0EJ9LL. Pearson's correlation coefficient and Spearman's rank correlation were used to determine the KAP correlation as well as the relationship between variables. The qualitative semi-structured questions were then developed regarded the KAP's survey results. The recorded interview data were transcribed verbatim in Thai. The audio recordings were re-listened and directly compared to the Thai transcriptions, then loaded into the Atlas.ti9 software program. A content analysis was used to breakdown the data and to create coding. Code-recoding of the results was performed by WP and the graduated research assistant (SP) which had been trained for qualitative data management and analysis to ensure coding agreement. The data were deductively coded accordingly, and inductively coding for emerging findings.

Triangulation of data

Methods triangulation from both quantitative and qualitative was undertaken based on guidance by Levitt and colleagues²⁶ and this involved the use of an implementation matrix to embed the findings before cross checking occurred to collaborate the findings.

Ethical approval

Ethical approval was obtained from the Ethics Committee for Human Study of Srinakharinwirot University (approval number: SWUEC-275/2563E; approval date: October 6, 2020). All participants were informed about the study objectives and data collection procedures. Study participants were assured of anonymity and confidentiality of their responses. All participation was on a voluntary basis.

Results

Of the 161 nursing student participants, their average age was 20.8 years old with the majority aged 20 years old (n = 47, 29.2%). The majority were female (n =150, 93.2%) and in their second year of study (n=76,47.2%). Traditionally, nursing students in Thailand live on campus, however due to COVID -19 during this time, they had been removed off campus and were living back in the family home (n =105, 65.3%) (Table 3). In the qualitative study (n = 13), majority were female (84.6%), and 18 to 23 years old.

Table 3 Sociodemographic characteristics (N = 161).

Characteristics	N (%)
Age (years)	
(Mean = 20.8, SD = 1.36)	
18	1 (0.6%)
19	27 (16.8%)
20	47 (29.2%)
21	38 (23.6%)
22	33 (20.5%)
23	9 (5.6%)
24	4 (2.5%)
25	2 (1.2%)
Gender	
Male	11 (6.8%)
Female	150 (93.2%)
Year of education	
First year	31 (19.2%)
Second year	76 (47.2%)
Third year	18 (11.2%)
Fourth year	36 (22.4%)
Accommodation	
University dorm	44 (27.3%)
Private dorm	7 (4.3%)
Own house	105 (65.3%)
Relative's house	3 (1.9%)
Friend's house	2 (1.2%)

The correlation of the KAP among nursing students amid COVID-19 pandemic

Due to the non-normality distribution of knowledge, Spearman's rank correlation was used to measure the correlation between knowledge and attitude, practice, and demographic variables.²⁷ Knowledge was significantly, positively correlated with attitude ($r_{\text{Spearman}} = 0.234$, P-value < 0.01) and negatively correlated with practice with no statistical significance ($r_{\text{Spearman}} = -0.036$). Practice and attitude was significantly, negatively correlated ($r_{\text{Pearson}} = -.207$, P-value < 0.01).

In terms of correlations with demographic characteristics, **knowledge** was significantly, positively correlated with age ($r_{\text{Spearman}} = 0.201$, P-value < 0.05), and year of education ($r_{\text{Spearman}} = 0.234$, P-value < 0.01), and negatively with habitat ($r_{\text{Spearman}} = -0.240$, P-value < 0.05). Practice was significantly, negatively correlated with habitat ($r_{\text{Pearson}} = -.190$, P-value < 0.05) (Table 4).

Table 4 Correlations between knowledge, attitude and practice and demographic characteristics (N = 161).

Variables	Correlations			
	Gender	Age	Education	Habitat
Knowledge		$r_{\text{Spearman}} = 0.201^*$	$r_{\text{Spearman}} = 0.234^{**}$	$r_{\text{Spearman}} = -0.240^*$
Attitude	$r_{\text{Pearson}} = -.049$	$r_{\text{Pearson}} = 0.006$	$r_{\text{Pearson}} = -0.010$	$r_{\text{Pearson}} = 0.062$
Practice	$r_{\text{Pearson}} = 0.032$	$r_{\text{Pearson}} = -0.085$	$r_{\text{Pearson}} = 0.060$	$r_{\text{Pearson}} = -0.190^*$

* P-value < 0.05; ** P-value < 0.01.

Analysis of the KAP

To expand the KAP's results, the in-depth semi structured interviewing emerged four main categories which were "there was no single trust source" (K), "the negative impacts on the students' mental health (A), "must be aware" (A), and "adjust to being transformed to new ways of learning and doing" (P). Details are as follows.

1) There was no single trust source (knowledge)

The participants acknowledged that their basic education in nursing assisted them to understand the nature of COVID-19. However, as COVID-19 a new emerging virus that poses a significant threat to human life, some participants expressed that they were at times 'spinning' or overwhelmed when attempting to remain across the vast breadth of information. They were aware of the influence of rumors, and fake news.

"As a nursing student, we have been learning and will be expecting to know about diseases... I monitored the COVID-19

information from the Twitter. I followed the trustable accounts. Twitter was quick and up to date..., but it also bad that allowed fake news. I have to differentiate which is true and which is false, which is spinning, or which is not" (D8p2)

The extent of information about COVID-19 personal protection was seen by the students as being the only part of the new normal practice regulations they felt they could trust. The students spoke of having to distill from the vast breath of information aspects of trust for example if there was any mention of personal protective equipment (PPE) before they engaged in the rest of the content. And this stemmed from the initial period of COVID-19 when reports were made that were not trustworthy.

2) The negative impacts on the students' mental health (attitude)

The participants expressed a perception of fatigue from having to study online and then be exposed to the national rates of those whom were infected and the daily dead rate as a stark illumination of severity of the virus. This caused great difficulty in their ability to undertake resilience within their everyday lives. From being removed from the support system in place on campus (domiciliary care, counsellors, mental health, spiritual) to online learning meant a removal back home. When speaking of being in this situation the participants described and expressed this often starting with the words "I feel ...". The five adverse feelings spoken of were of being stressed, worried, lost opportunities, hopelessness, and loneliness.

Stress: "I felt tired, discouraged, didn't want to do anything, and slept all day...I am having accumulated stressed." (D12p29)

Worried: "I worried that I may am infected. I also worried about transmission...uhm I'm fear that I may spread the infection to other people" (D2p7)

Lost opportunities: "I feel sorry for my time and my opportunity. It's a situation that has been going on for years now...places closed so we can't go and can't do activities...we have to study online" (D3p8)

Hopeless: "...not meet with people in person, and not going out to the environment were induced you to be depressed right! I feel discourage and hopeless. My life has changed. I have to wear a mask, wash hands very often, remain distance to other, and apart from social gathering" (D10p1)

Lonely: *"I didn't talk to my friends at all, so it made me feel like I was only by myself. I think I was like unconsciously irritated. Yeah! I am so lonely"* (D13p31)

3) Must be aware (attitude)

The students articulated how they valued their knowledge gained from their education. This was explained within the contexts of self-prevention, the danger of the disease, and how to not to become a spreader. This was related to the participants' attitude towards their knowledge and in turn became part of their consciousness which was expressed as a behaviour.

"It is uncontrollable, and everyone must be aware that it is important at all times. We must be aware of the dangers of the disease and how to not be infected or not spread the infection, and this is how we continue through the COVID-19 disease...have to wear more protective clothing, face shield, n95 mask, and gloves" (D1p3)

However, the participants expressed a sense of frustration of not being actively involved in the health community response. They felt disempowered, as they were mostly staying in their own homes had awareness but were inactive for any clinical COVID-19 practices.

4) Adjust to being transformed to new ways of learning and doing (practice)

During this study period, all students had had all their clinical placements cancelled, with no knowledge of when this would be changed. However, they did have a reassurance, they will resume placement when COVID-19 had passed its critical stage. When speaking of being in the situation of movement from traditional educational delivery into a new normal space of online delivery, the students shared their experiences of being in a liminal space. The participants expressed that the change was unexpected, and it had impacted all aspects of their lives. For some students, they stepped across the liminal space as an abrupt process.

"I was just placed into the hospital ward [for clinical placement] and was there for two days, and then it was announced that I had to stop attending and then do online study. That was the period that I needed to be adjusted to, and then I knew I have to deal with it" (D4p2)

While the change into a new normal for educational provision was unexpected, the students expressed a sense of

identity during their journey towards graduation. They spoke of their perception of being a nursing student meant having resilience and being adaptable.

"...all nursing students require adaptation into a new society... to take care of patients during this outbreak. If we have to apply the new normal ways of living in our lives, we have to have a new normal way to study in nursing, and on how care for patients as well." (D7p6)

They also provided constructive criticism on their progression through the degree, noting aspects such as infection control during pandemics and personal protective equipment use needed to be more at the fore front of content delivery across the nursing program.

"The accurate practice should be learned at the first place, and the safest form of practice should be educated to the student. We should be taught how to be safe. Even though the hospital staff may say that it is not a PUI [Patient Under Investigation] for COVID 19 patient." (D3p6)

They also identified when they felt that content delivery was outdated as *"We need the courses to be regularly updated all the time, because the situation in a pandemic always moving which might meant the course content has lagged behind and it means the content delivered will not be the current correct standard according to what should be practiced"* (D8p2).

Students also stated they appreciated the importance of clinical placement more, and how aspects such as communication and rapport cannot be substituted with a virtual or simulated learning experience as *"Simulation training is training with mannequins, and it is a training of nursing treatment, cares and nursing principles. But I also think that I should be able to have the normal teaching, on the clinical placement... to establish communication and therapeutic relationships with the patients, and with the older nurses"* (D13p47)

Accordingly, the participants predominantly related the KAP experienced to the nursing course. This allied to the 'new normal' of study in nursing. The participants were agreeable to the possibility of distance and online teaching, for theoretical subjects. Since the participants see themselves involved in this situation, they had been discussed to be learned and grown in the five aspects as follows. First, as a student, they require a new method to guide them how to care

for their patients while COVID-19 has not yet over. Second, accurate regulations and the safest form of practice with self-protection equipment should be provided at the beginning of the course. Third, there should be regular updates and no course lag. Fourth, various online channels are necessary for them to learn at any times. Fifth, they should be able to meet traditional normal teaching which establish communication and relationship with patient, and real nurses, i.e., in person.

Discussions and Conclusion

Knowledge correlated with attitude but not with practice

This study has demonstrated that the concept of the KAP is theoretically linked with high knowledge to positive attitudes and improves the practice.²⁸ Nursing students were more likely to have deployed their knowledge, to have an affirmative attitude and turned it into their practice.²⁹ This study also highlighted the altered findings where the knowledge presented was statistically significant to attitude, but not to practice. The qualitative data evidentially explains the knowledge of COVID-19 in relation to nursing studies were based on doubt, which could possibly adopt pro and con directions of attitude. These reactions were likely due to the fact that COVID-19 is a new emerging disease and it's common for humans to fear something that is not fully understood.³⁰ The result of this study also agreed with studies from Mainland China³¹ and Italy^{28,32} that a core competency of undergraduate nursing requires evidence-based and scenario-based teaching to assist the student to filter the vast-breadth information. Accordingly, problem-solving skills in clinical and epidemiological environment should be provided to help them perform their profession effectively and safely.^{7,16}

A sense of incomplete knowledge mixed with untrusted material around the pandemic caused uncertainty in the process of nursing education. Similarly, nursing students in Jordan identified uncertainty of the unknown as the significant feelings in the middle of the sudden changes imposed by COVID-19.¹⁵ As the COVID-19 information had been widely spread across social media and social networks. These inferred to be related to an inadequate understanding, and the amount of ambiguous information about COVID-19 as treatment which often proved ineffective, and there was at the initial insignificant mortality rate.³³ The ability to separate rumor from fact, however, was a significant hurdle. Fake information can cause psychological unrest, including tension

and stress, for students.³⁴ To minimize an overload of information, access to short summaries which are created through official sources are recommended.²⁸

For those aspects of practice which were theoretically expected to be related to knowledge was not represented in this study. The factor of habitat presented a negative statistical correlation to the practice. This was possibly caused by the urgent plan that had been implemented, where all nursing students had been removed from the onsite premises to study offsite in online classes. Due to the online learning circle developed, they had less opportunity to practice on their obtained knowledge into their real life. Accordingly, gaps between knowledge and attitude to practice remained as previously presented. This is not new news, as previously Thai healthcare workers were observed and found to have incorrect practice for compliance with handwashing as high as 60%.³⁵ As well, having low levels of the knowledge of the impacts of eating and drinking together within a group, as well as understanding on aerosol transmission, the recommendations for physical distancing, and guidance for face covering were all perceived as having low awareness.³⁵

In addition, our study captured the sense of disempowerment or missing out, as not being able to be fully active within health care and provision of assistance during the COVID-19 situation. This reflected the faith of being a nurse and how they saw themselves as wanting to be part of it. Therefore, the students did not report on reliance on one single source of information but collated information from those who they felt could be trusted. These students were engaging in critical thinking of application of their learnings from study to determine the quality of the message which was being conveyed. However, most of the participants stayed at home and interacted or circulated with one another by online learning, and this was when they revealed that they were not able to perform their practice. To move forward, they held new perceptions on how crucial they will be once the initial pandemic is over and they are qualified.

Online learning and nursing studies

Online learning during the COVID-19 increased academic delay, with an increased stressor being nursing students who feared falling behind their peers.³⁶ In a study in the Philippines, nursing students stated they had higher levels of stress, and this led to lower satisfaction levels towards online learning. It transformed into those students having comparatively poorer

academic performances.³⁷ This, like the previous studies, such as the Uganda's nursing students study, indicated e-learning during the crisis of COVID-19 has reduced their quality of knowledge and caused them to hold a negative attitude.³⁸ With the experience of sudden change of educational platform, online learning triggered exhaustion, reduced motivation, and created discontentment.¹⁴ Unsurprisingly, this study identified that the attitudes among Thai nursing students amid COVID-19 crisis tended to trend in a negative direction towards the significant feelings of stressed, being worried, feeling sorry for lost opportunities, a sense of hopelessness, and feeling lonely. This study has captured the students' notions of being trapped in an endless monotony of a cycle of study, assignments, and a lack of interaction. They were devastated from being cut out of their student community life and from being removed and having to adhere to an online schedule. These findings relate other studies gathered from Indonesia, the Philippines, Vietnam, Hong Kong, Malaysia, and Thailand.¹⁶ It has been described that being part of the nursing school provides a bond for the student's socialization process and it had built into the meaningfulness of friendship. When their live learning space has been cut off, it led to the feeling of being unsupported, social isolation, and psychological distress.¹⁶ Once an online learning took place, it also led to less motivation, inability to focus, and the disconnection between complex theories to clinical practice.²⁸ Moreover, how they resumed a healthy connection and transform online to confront in-person relationship is challenged. This could impact their mental health status where the learning course should be concerned.

Essential skills for nursing students including human-touch, empathy, and a sense of caring, were considered to be areas of focus. The practice of such skills, especially building rapport, developing interpersonal communication skills and relationships, and clinical nursing skills could not be taught effectively solely by online classes. Moreover, teaching clinical techniques including psychomotor skills such as intravenous cannulation and vein puncture, and various types of injections was of significant concern. The evolving educational landscape in nursing necessitates an adaptation to the "new normal." This adaptation involves a strategic blend of traditional onsite classes and online platforms, rather than a complete shift from onsite to online instruction.

Furthermore, it is recommended that nursing education should be reformed based on international and national

standards, including nursing competency, and nursing educational resources.³⁹ Due to the COVID-19 transmission pattern, the course is needed to enhance the learner's individuality and ability to work independently.⁴⁰ This reference to the educational system must be accessible and available at any time to the students. Obtaining more skills in the areas of technology, time management, simulation learning methods, and the ability to be resilient were additionally required.^{41,42}

This present study has certain limitations. This study was conducted among undergraduate Thai nursing students, in the Faculty of Nursing which would limit for generalisability. The results could be biased due to personal experience and culture. The majority of participants in the study were predominantly female, possibly leading to a dominant intrapersonal influence on female perceptions.

In conclusion, explanatory mixed method approach allowed this study to understand the concept of KAP model regarding being nursing students amidst the COVID-19 pandemic. The findings highlighted the correlation between the knowledge and attitude but not the practice. Our study revealed that nursing students who studied through online learning were unable to simulate the psychomotor of nursing skills, and it could not replace an in-person clinical experience. Distance online study where the schedule led students to experience relentless cycle perhaps disrupted the theoretical concept of KAP. On the other hand, the knowledge of COVID-19 was massive information and mixed with fake news and unverified information. The only reliable information was the self-protection practice which was wearing a mask and face shield, hand washing, and avoiding public places. For attitude, undesirable feelings as well as self-awareness and being transformed were found responding to the COVID-19 outbreak. Being a nursing student helped them differentiate the information and helped themselves in accepting the negative feelings despite adverse situation. Nursing students thus did not accept entirely replacing traditional teaching with the online platform. They required an up-to-date curriculum, hybrid strategy, with both online and offline components, to motivate, encourage, and continue the process of enhancing the teaching of nursing competencies. The communication and psychomotor skills required in-person training. Innovation of nursing studies is promptly essential, both now and into the future, to ensure adequate delivery of nursing education in the face of unpredictable occurrences such as global pandemics.

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References

1. Gunawan J, Aunguroch Y, Marzilli C. New Normal in Covid-19 Era: A nursing perspective from Thailand. *J Am Med Dir Assoc* 2020;21(10):1514–1515.
2. International Council of Nurses. Nursing education and the emerging nursing workforce in Covid-19 pandemic. 2021. (Accessed Jan. 10, 2022, at https://www.icn.ch/sites/default/files/2023-06/ICN%20Policy%20Brief_Nursing%20Education.pdf)
3. Ard N, Beasley SF, Nunn-Ellison K, Farmer S. Responding to the pandemic: Nursing education and the ACEN. *Teach Learn Nurs* 2021;16(4):292-295.
4. Brandau M, Buchman S, Castrovillari M, Wood E. The uncertain impact of the pandemic on nursing and nursing education: Faculty and undergraduate student introspection. *SSRG International J Nurs Health Sci* 2021;7(1):12-14.
5. Kang J. Introduction to the special issue: Nursing education and research in the remote era. *Asian Nurs Res* 2021;15(5):327-328.
6. Kaliyaperumal I. Guideline for conducting a knowledge attitude and practice (KAP) study, *Diabetic Retinop Proj* 2004;4(1). (doi: https://v2020eresource.org/content/files/guideline_kap_Jan_mar04.pdf)
7. Siddiquea BN, Shetty A, Bhattacharya O, Afroz A, Billah B. Global epidemiology of COVID-19 knowledge, attitude and practice: a systematic review and meta-analysis. *BMJ Open* 2021;11(9):e051447. (doi: 10.1136/bmjopen-2021-051447)
8. Rahiman F, Chikte U, Hughes GD. Nursing students' knowledge, attitude and practices of infection prevention and control guidelines at a tertiary institution in the Western Cape: A cross sectional study. *Nurs Educ Today* 2018;69:20-25.
9. Gassas R. Sources of the knowledge-practice gap in nursing: Lessons from an integrative review. *Nurse Educ Today* 2021;106:105095. (doi: 10.1016/j.nedt.2021.105095)
10. Ulenaers D, Grosemans J, Schrooten W, Bergs J. Clinical placement experience of nursing students during the COVID-19 pandemic: A cross-sectional study. *Nurs Educ Today*. 2021;99:104746. (doi :10.1016/j.nedt.2021.104746)
11. Velarde-Garcia JF, Cachon-Perez JM, Rodriguez-Garcia M, et al. The challenges of learning on the go: A qualitative study of final-year Spanish nursing students incorporated to work during the first Covid-19 pandemic. *Nurs Educ Today* 2021;103: 104942. (doi: 10.1016/j.nedt.2021. 104942)
12. McKay MA, Pariseault CA, Whitehouse CR, Smith T, Ross JG. The experience of baccalaureate clinical nursing faculty transitioning to emergency remote clinical teaching during the COVID-19 pandemic: Lessons for the future. *Nurs Educ Today* 2022;111:105309. (doi :10.1016/j.nedt.2022.105309)
13. Warshawski S. Academic self-efficacy, resilience and social support among first-year Israeli nursing students learning in online environments during COVID-19 pandemic. *Nurs Educ Today* 2022;110:105267. (doi: <https://doi.org/10.1016/j.nedt.2022.105267>)
14. Kunaviktikul W, Ang E, Baridwan NS, et al. Nursing students' and faculty members' experiences of online education during COVID-19 across Southeast Asia: A photovoice study. *Nurs Educ Today* 2022;111:105307. (doi: 10.1016/j.nedt.2022.105307)
15. Suliman WA, Abu-Moghli FA, Khalaf I, Zumot AF, Nabolsi M. Experiences of nursing students under the unprecedented abrupt online learning format forced by the national curfew due to COVID-19: A qualitative research study. *Nurs Educ Today* 2021;100: 104829. (doi: 10.1016/j.nedt.2021.104829)
16. Shorey S, Ang E, Baridwan NS, et al. Salutogenesis and COVID-19 pandemic impacting nursing education across SEANERN affiliated universities: A multi-national study. *Nurse Educ Today* 2022;110: 105277. (doi: 10.1016/j.nedt.2022.105277)
17. Thailand Nursing and Midwifery Council. Licensing. 2021. (Accessed on Dec. 4, 2021, at <https://www.tnmc.or.th/news/en/311>) (in Thai)
18. World Health Organization. Global standards for the initial education of professional nurses and midwives. 2009. (Accessed Dec. 4, 2021, at https://applications.emro.who.int/dsaf/EMROPUB_2015_EN_1866.pdf)
19. Baker C, Cary AH, da Conceicao Bento M. Global standards for professional nursing education: The time is now. *J Prof Nurs* 2021; 37(1):86-92.
20. Gumucio S, Merica M, Luhmann N, et al. Data collection quantitative methods, the KAP survey model (knowledge, attitude & practices). IGC Communigraphie Saint Etienne France 2011. (doi: https://www.google.com/search?q=Gumucio+S.+Data+collection+Quantitative+methods+The+KAP+survey+model.+Knowledge%2C+Attitude+%26+Practices.+2011&sca_esv=595292778&sxsrf=AM9HkKkKJsyiYZpN5tnM21EnTewmT_FLg%3A1704266192270&ei=0AmVZaf4D5KaseMPzvCA4AM&udm=&ved=0ahUKEwinoPin1sCDAXUSTWwGHU44ADwQ4dUDCBA&uact=5&oq=Gumucio+S.+Data+collection+Quantitative+methods+The+KAP+survey+model.+Knowledge%2C+Attitude+%26+Practices.+2011&gs_lp=Egxn3Mtd2l6LXNlcnAia0d1bXVjaW8gUy4gRGF0YSBjb2xsZWNoaW9uIFF1YW50aXRhdGl2ZSBiZXRRob2RzIFRoZSBLQVAgc3VydmV5IG1vZGVsLiBLbm93bGVkZ2UsIEF0dGl0dWRlICYgUjY3RjY2VzLiAyMDExSABQAFgAcAB4AJABAjgBAKABAKoBALgBA8gBAPgBAvgBAeIDBBgAIEE&scit=gws-wiz-serp)
21. Greene JC, Caracelli VJ, Graham WF. Toward a conceptual Framework for mixed-method evaluation designs. *Educ Eval Policy Anal* 1989; 11(3):255-274.
22. Zheng M. Conceptualization of cross-sectional mixed methods studies in health science: A methodological review. *Int J Quantit Qualit Res Methods* 2015;3(3):66-87.
23. Ivankova NV, Creswell JW, Stick SL. Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods* 2006;18(1):3-20.
24. Fricker RD. Sampling methods for online surveys. *The SAGE handbook of online research methods*. SAGE, 2016: pp.162-183.
25. Department of Disease Control, Ministry of Public Health. Corona virus (Covid-19). 2020. (Accessed on Dec. 4, 2021, at <https://ddc.moph.go.th/viralpneumonia/index.php>) (in Thai)
26. Levitt HM, Bamberg M, Creswell JW, Frost DM, Josseswell R, Suarez-Orozco C. Journal article reporting standards for qualitative primary, qualitative meta-analysis, and mixed methods research in psychology: The APA Publications and Communication Board Task Force report. *Am Psychol* 2018;73(1):26-46.

27. Kim H-Y. Statistical notes for clinical researchers: assessing normal distribution (2) using skewness and kurtosis. *Restor Dent Endodont* 2013;38(1):52-54.
28. Santangelo OE, Provenzano S, Armetta F, et al. Knowledge, attitudes and practices towards COVID-19 among nursing students of the University of Palermo: results from an online survey. *J Prev Med Hyg* 2021;62(2):e270-e276. (doi: 10.15167/2421-4248/jpmh2021.62.2.1703)
29. Yeunyaw T, Promwong W, Kadsanit K. Knowledge, attitude and prevention behaviour of Coronavirus disease 2019 (COVID-19) infection among nursing students in Boromarajonani college of nursing, the north eastern region network. *Udonthani Hosp Med J* 2021;29(2):204-213. (in Thai)
30. UNICEF. Social stigma associated with COVID-19. 2019. (Accessed on Apr. 5, 2020, at [https://www.unicef.org/media/65931/file/Social%20stigma%20associated%20with%20the%20coronavirus%20disease%202019%20\(COVID-19\).pdf](https://www.unicef.org/media/65931/file/Social%20stigma%20associated%20with%20the%20coronavirus%20disease%202019%20(COVID-19).pdf))
31. Zhou H, Zhao R, Yang Y. A qualitative study on knowledge, attitude, and practice of nursing students in the early stage of the COVID-19 epidemic and inspiration for nursing education in mainland China. *Front Public Health* 2022;10:845588. (doi: 10.3389/fpubh.2022.845588)
32. Provenzano S, Santangelo OE, Armetta F, et al. COVID-19 infection: comparing the knowledge, attitude and practices in a sample of nursing students. *Acta Biomed* 2020;91(12-s):e2020001. (doi: 10.23750/abm.v91i12-S.10252)
33. Koffman J, Gross J, Etkind SN, Selman L. Uncertainty and COVID-19: How are we to respond? *J Royal Soc Med* 2020;113(6):211-216.
34. Lovric R, Farcic N, Miksic S, Vcev A. Studying during the COVID-19 pandemic: A qualitative inductive content analysis of nursing students' perceptions and experiences. *Educ Sci* 2020;10(7):188. (doi: 10.3390/educsci10070188)
35. Maude RR, Jongdeepaisal M, Skuntaniyom S, et al. Improving knowledge, attitudes and practice to prevent COVID-19 transmission in healthcare workers and the public in Thailand. *BMC Public Health* 2021;21(1):1-14. (doi: 10.1186/s12889-021-10768-y)
36. Aldridge MD, McQuagge E. Finding my own way: The lived experience of undergraduate nursing students learning psychomotor skills during COVID-19. *Teach Learn Nurs* 2021;16(4):347-351. (doi: 10.1016/j.teln.2021.07.002)
37. Oducado RM, Estoque H. Online learning in nursing education during the covid-19 pandemic: Stress, satisfaction, and academic performance. *J Nurs Pract* 2021;4(2):143-153.
38. Olum R, Atulinda L, Kigozi E, et al. Medical education and e-learning during covid-19 pandemic: Awareness, attitudes, preferences, and barriers among undergraduate medicine and nursing students at Makerere University, Uganda. *J Med Educ Curric Dev* 2020;7:2382120520973212. (doi: 10.1177/2382120520973212)
39. Thojampa S, Klankhajhon S. Editorials: Nursing education during Covid-19 pandemic. *Jurnal Ners* 2020;15(1). (doi: <https://e-journal.unair.ac.id/JNERS/issue/view/1266>)
40. Negi L, Parel JT. COVID 19 and nursing education in India: a paradigm shift from conventional to online. *Asian J Res Nurs Health* 2020;3(3):388-43.
41. Oducado RM. New normal in nursing education: Sophomore students' expectations of and readiness for online learning in the era of COVID-19 pandemic. *Int J Caring Sc* 2021;14(2):1170-1177.
42. Oducado RM, Soriano GP. Shifting the education paradigm amid the covid-19 pandemic: Nursing students' attitude to e-learning. *Afr J Nurs Midwife* 2021;23(1):1-14.