RESEARCH ARTICLE

Development and Effect of the Online HIV Prevention and Care Training (HPCT) Program for Student Nurses

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Abstract

Student nurses must be competently prepared to address the rising human immunodeficiency virus (HIV) epidemic in the Philippines. This article presents the development and effect of the online HIV Prevention and Care Training (HPCT) program for student nurses. The Iowa Model-Revised guided the development of the program. Literature review, student and faculty engagements, advocate participation, resources and protocol assessment, and pre-HPCT survey analysis were systematically performed to determine the contents and delivery of the program. The participants were 2nd and 3rd year level student nurses who were asked to answer the pre- and post-HPCT online surveys containing sociodemographic, HIV knowledge, attitudes, and perceived practices, and program evaluation questionnaires. Descriptive and inferential statistics were performed using SPSS version 23. Student nurses in the post-HPCT survey obtained significantly higher HIV knowledge scale mean scores (mean=18.22, SD=4.138) than those in the pre-HPCT survey (mean=15.01, SD=4.069) (p=.000). Pre- to post-HPCT survey revealed significant decreases in the proportions of student nurses who agreed on the following: HIV-positive patients should not be put in rooms with other patients when admitted to hospital (44.3%, 31.6%; p=.004); the need to worry about putting family and friends at risk of contracting the disease when caring for a person with HIV/AIDS (39.7%, 26.4%; p=.002); and healthcare workers are worried of getting HIV/AIDS from caring for a person with HIV/AIDS in their work environment (47.2%, 37.5%; p=.011). Significantly, more student nurses in the post-HPCT survey agreed in all the items of the HIV practice scale than those in the pre-HPCT survey. The online HPCT program was acceptable with beneficial effects on student nurses' HIV knowledge, attitudes, and perceived practices. There is a need to highlight basic HIV concepts and integrate HIV developments in the education of student nurses.

Keywords: *evidence-based nursing, HIV, program development, student nurses, online learning*

Introduction

Despite multiple efforts exerted on prevention, treatment, and management, human immunodeficiency virus (HIV) remains a national and global public health concern. To eradicate the acquired immunodeficiency syndrome (AIDS) epidemic by 2030, the Joint United Nations Programme on HIV/AIDS (UNAIDS) (2015) set the global HIV targets of 95-95-95. This target means that 95% of persons living with HIV (PLHIV) will know their status, with 95% of them on treatment and 95% virally suppressed among treated. Comprehensive and intensified efforts are being exerted to fight the burgeoning impact of HIV in the Philippines. The country's total financial expenditures for HIV in 2013 were around USD 10.3 million, with most of the finances coming from domestic public and international global funds (UNAIDS, 2020). The approval of Republic Act 11166 (Philippine HIV and AIDS Policy Act) in 2018 aims to strengthen the delivery and access of comprehensive and multi-sectoral HIV prevention, education, treatment, and care programs. The use of pre-exposure prophylaxis (PrEP) and HIV self-test kits has been rolled out (UNAIDS, 2021). Despite the availability of services and allocation of resources for HIV prevention and treatment, the Philippines fell short in reaching global HIV targets, with only 73% of PLHIV knew their status, and 61% of them on treatment in 2019 (UNAIDS, 2020).

Health professionals are vital resources to improve HIV prevention and care service delivery. However, they must

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possess the competency to provide evidence-based and culturally congruent care for Filipinos at risk of HIV and those living with HIV. It has been reported that health professionals exhibit stigma that discourages people from accessing and using HIV prevention and care services (Arias-Colmenero et al., 2020; Ingram et al., 2019). HIV-related stigma is negatively associated with PLHIV's medication adherence and quality of life (Ingram et al., 2019). To address this concern, HIV-related training and educational programs can increase the capacity of health professionals to meet the varying and complex needs of populations at risk of HIV and PLHIV (Feyissa et al., 2019). In a cross-sectional study, doctors with formal HIV/AIDS training were less likely to show discriminatory intent at work (Vorasane et al., 2017). Nurses with formal HIV/AIDS training were less likely to have feelings of not providing good care for PLHIV (Vorasane et al., 2017). Different modes, activities, and platforms to deliver HIV education have significant effects on recipients' HIV knowledge, attitudes, and perceptions (Feyissa et al., 2019). Basic and updated HIV-related education and training can eliminate or reduce HIV-related stigma in healthcare, thus, promoting optimal delivery of HIV-related services to individuals and communities. This article reports the development and impact of the online HIV Prevention and Care Training (HPCT) program for student nurses as part of a doctoral course in Nursing and Health Program Development.

Program Development and Implementation

We used the IOWA Model-Revised (Iowa Model Collaborative et al., 2017) to guide the program's development, implementation, and evaluation. The model provides a systematic and evidence-based approach to organizing a team to create, implement, and evaluate an intervention. We followed the six steps of the model.

Program team creation and setting identification

We created the online HPCT program with guidance from an expert in Nursing science, adult health, and health program development. Our team was composed of four Doctor of Philosophy in Nursing students with varying work experience and educational backgrounds. The conceptualization of the program started in December 2020, and then succeeding meetings were made to plan the program.

Search and synthesis of body of evidence

In search of the current guidelines, best practices, and training materials on educating student nurses on HIV prevention and care, online databases were used that included CINAHL, ProQuest, PubMed, and ScienceDirect. The keywords combined and used for the literature search were HIV, AIDS, nursing, competency, training, and education. Each of the implementers conducted a literature search. Eventually, we discussed and compared the literature that we found during meetings. Through this step, we identified salient topics and teaching strategies in HIV education. Finally, we synthesized it by creating an initial outline of topics and the related activities and ways of delivering them.

Student and faculty engagement and preferences

Initially, we planned to implement the program in one nursing school. However, we decided to open it to student nurses from different nursing schools based on the recommendations by a dean of a nursing school, a student nurse organization, and faculties. We interviewed course coordinators and faculties involved in HIV education to examine the contents and delivery of HIV lectures and discussions. It helped review the units and time, duration and coverage, and teaching strategies for HIV education.

Assessment of resources and protocols

We examined various resources like teaching plans, materials, and protocols on HIV education. We reviewed current literature on HIV in the Philippines, including policies and programs of different agencies such as the Department of Health (DOH), World Health Organization (WHO), and UNAIDS. We examined the Nursing curriculum from the Commission on Higher Education (CHED) and other nursing schools to further identify the scope and components of the program.

We used the frameworks by McNairy and El-Sadr (2014) and Fox and Rosen (2017) to refine and broaden the initial outline of the program. McNairy and El-Sadr's (2014) framework focused on four main points of the HIV prevention continuum, while Fox and Rosen's (2017) focus on salient points of the HIV care continuum.

Develop and implement the program and create an evaluation plan

To be included in the program, student nurses should be 2nd and 3rd year level and agree with the participation agreement form. At these levels, participants were expected to have taken fundamental courses in Nursing, making the program appropriate to them. We sent the program invitation and Zoom link to participants who registered and met the criteria. To recruit participants, we sent emails to respective heads, coordinators, faculties, and student nurse organizations of different Nursing schools. Flyers were also posted on Facebook and shared with possible links to target participants.

The online HPCT program was conducted in April 2021 using Zoom to reach student nurses located in various locations in the Philippines. This mode of delivery removed the risk of COVID-19 transmission by preventing direct contact among the program implementers and participants. Two weeks before the program, a pre-analysis of student nurses' sociodemographic characteristics

Table 1. *Outline of the Online HIV Prevention and Care Training (HPCT) Program*

Focus	Topics	Duration	Time
HIV Prevention Continuum	• Introduction to the Program	15 minutes	1:00 PM – 1:15PM
	• Basics and Epidemiology of HIV and AIDS	15 minutes	1:15 PM – 1:30 PM
	• HIV testing, counseling, and prevention	15 minutes	1:30 PM – 1:45 PM
	• Philippine Policies and Laws on HIV prevention and care	15 minutes	1: 45 PM – 2:00 PM
	• HIV at-risk populations and HIV prevention-related stigma	15 minutes	2:00 PM – 2:15 PM
	• Innovations in HIV prevention	15 minutes	2:15 PM – 2:30 PM
	Workshop, Question and Answer Session, and Break	30 minutes	2:30 PM – 3:00 PM
HIV Care Continuum	• Impact of HIV on individuals and community	15 minutes	3:00 PM – 3:15 PM
	• HIV care-related stigma	15 minutes	3:15 PM – 3:30 PM
	• Caring for Persons Living with HIV	15 minutes	3: 30 PM – 3: 45PM
	• Promoting Adherence and Retention to Care and U=U	15 minutes	3: 45 PM – 4: 00 PM
	Workshop, Question and Answer Session, Post-Program Survey, and other activities	30 minutes	4:00 PM – 4:30 PM

and HIV knowledge, attitudes, and perceived practices were performed to modify some of the program's contents, activities, and delivery methods. Table 1 presents the outline of the program's topic, time, and activities. The first two hours focused on topics about HIV prevention continuum while the following two hours focused on topics related to HIV care continuum.

We implemented several activities, including lecture discussions, video presentations, short case scenarios, workshops, and question and answer portions. In addition, we presented short videos of the experiences of an HIV nurse, an HIV program manager, and a PLHIV. Adjustments were made at the time of the program because of technical issues encountered. The program was done for 4 hours instead of the initial 3 ½ hours. At the end of the program, student nurses were requested to answer the same pre-HPCT questionnaires and the program evaluation questionnaire. Certificates of attendance were given to those who completed the program.

Data collection was done using online surveys. Student nurses were requested to read and accomplish the participation agreement form which contained information about the objectives, mechanics, and nature of participation in the program. It was explained to them that participation in the program was voluntary, and they had the right not to participate or withdraw their participation without any repercussions. They were informed of how the data they provided would be protected, used, and discarded. This program was offered to student nurses at no cost.

The sociodemographic questionnaire collected student nurses' age, sex, gender identity or sexual orientation, year level, nursing school location, and prior HIV education attendance. With permission from the primary author, the HIV/AIDS Knowledge, Attitude and Practice (KAP) questionnaire (Delobelle et al., 2009) was used to measure student nurses' HIV knowledge, attitudes, and perceived practices. In the study of Delobelle et al. (2009), the questionnaire was validated by a public health and nursing expert. Its reliability was assessed by computing the Cronbach's alpha coefficient with a value of 0.77 for the knowledge scale and 0.63 for the attitude scale. The practice scale was modified to capture student nurses' perceived present and future practices in HIV prevention and care.

The knowledge scale has 28-items about HIV-related knowledge and scored as 'true,' 'false,' or 'don't know.' The attitude scale was used to measure attitudes toward PLHIV. This scale has 10 items rated on a five-point Likert scale (1 as 'strongly disagree,' 3 as 'neither disagree nor agree,' and 5 as 'strongly agree'). The practice scale was used to measure HIV-perceived practices. This scale has 10 items scored as 'yes,' 'no,' or 'not applicable.' We used a program evaluation questionnaire rated on a five-point Likert scale (1 as 'strongly disagree' and 5 as 'strongly agree') to determine student nurses' perceptions of the program's duration, content, speakers, delivery, and impact. We added open-ended questions to identify student nurses' perceptions about the strengths and points for improvements of the program.

Program Evaluation

Responses in the survey were entered into an Excel file to examine the completeness of the data. SPSS version 23 was used in the data analysis. Descriptive statistics (mean, *SD*,

frequencies) were used to describe student nurses' responses on the sociodemographic, HIV knowledge, attitudes and perceived practices, and program evaluation questionnaires. Inferential statistics (independent *t*-test, paired *t*-test, McNemar's test) were used to compare student nurses' characteristics and HIV knowledge, attitudes, and perceived practices before and after the program. An alpha level of .05 was used to determine significant findings. Summative content analysis was used to analyze responses to open-ended questions. Qualitative responses were counted and grouped according to identified categories. Tables were used to present summaries of the evaluation of the program.

Student nurses' sociodemographic characteristics

A total of 324 student nurses agreed and registered in the program. However, 17 pre-HPCT surveys submitted by 4th-year level student nurses were excluded from the analysis. After the program, 298 survey submissions were received, with ten submissions by 4th-year level student nurses excluded from the analysis. The final analysis of the post-HPCT survey involved 288 student nurses, which is 6.2% lower than the number of student nurses in the pre-HPCT survey (n=307).

Most student nurses who submitted the pre-HPCT survey were aged ≥ 21 years (50.8%), female (83.4%), heterosexuals (84.7%), 3rd-year level (50.5%), studying in nursing schools within the National Capital Region (52.1%), and without prior HIV education attendance (74.9%) (Table 2). These characteristics were also similar to post-HPCT student nurses except that there were an equal number of those aged 18 to 20 years (50.0%) and ≥ 21 years (50.0%), while more 2nd-year level student nurses (54.2%) and studying in nursing schools outside

Table 2. *Comparisons of student nurses' characteristics in the pre- and post-HPCT surveys*

	Pre-HPCT (N=307)		Post-HPCT (N=288)		
	n	%	n	%	*p*-value
Age group					.568
18-20 years	151	49.2	144	50.0	
≥21 years	156	50.8	144	50.0	
Sex at birth					.561
Male	50	16.3	40	13.9	
Female	256	83.4	248	86.1	
Prefer not say	1	0.3	0	0.0	
Gender identity and sexual orientation					.727
Straight/Heterosexual	260	84.7	248	86.1	
Sexual and gender minorities	32	10.3	30	10.4	
Bisexual man	9	2.9	8	2.8	
Bisexual woman	13	4.2	15	5.2	
Gay man	9	2.9	6	2.1	
Transgender woman	1	0.3	1	0.3	
Prefer not to say	15	4.9	10	3.5	
Year level					.128
II	152	49.5	156	54.2	
III	155	50.5	132	45.8	
School location					.007*
Within NCR	160	52.1	122	42.4	
Outside NCR	147	47.9	166	57.6	
Luzon	114	37.1	95	32.9	
Visayas	14	4.6	63	21.9	
Mindanao	19	6.2	8	2.8	
Prior HIV education attendance					0.475
Without	230	74.9	222	77.1	
With	77	25.1	66	22.9	

Note: **significant at α level of .05 using McNemar's test, HPCT= HIV Prevention and Care Training, NCR= National Capital Region*

the National Capital Region (57.6%). Significantly more student nurses from nursing schools outside the National Capital region responded in the post-HPCT survey (57.6%) than in the pre-HPCT survey (47.9%) (*p*=.007).

HIV training attendance

Student nurses reported that the hours of HIV training or lecture they received ranged from 30 minutes to 6 hours. The focus of the training or lecture they attended were commonly on awareness and prevention (26.2%) and pathophysiology (11.5%), and minimally on safe sex practice (4.1%), HIV transmission (3.3%), the myths and facts of HIV (1.6%), and nursing considerations and care (1.6%).

HIV knowledge

Table 3 shows that student nurses in the post-HPCT survey obtained significantly higher HIV knowledge scale mean scores (mean=18.22, *SD*=4.138) than those in the pre-HPCT survey (mean=15.01, *SD*=4.069) (*p*=.000). In the pre-HPCT survey, significantly higher HIV knowledge scale mean scores were observed among student nurses aged ≥ 21 years (*p*=.001), in the 3rd year level (*p*=.000), studying within the National Capital Region (*p*=.000), and with prior HIV education attendance (*p*=.001). These findings were similar in the post-HPCT survey except having no significant difference in the HIV knowledge scale mean scores between those with and without prior HIV education attendance (*p*=.107).

HIV attitudes

From pre-to post-HPCT surveys, significant decreases were observed in the proportions of student nurses who agreed on the items: 'patients who are HIV-positive should not be put in rooms with other patients when admitted to hospital' (44.3%, 31.6%; *p*=.004); 'the need to worry about putting family and friends at risk of contracting the disease when caring for a person with HIV/AIDS' (39.7%, 26.4%; *p*=.002); and 'healthcare workers are worried of getting HIV/AIDS from caring for a person with HIV/AIDS in their work environment' (47.2%, 37.5%; *p*=.011). The rest of the items in the attitude scale did not show significant differences in the proportion of student nurses who agreed or disagreed (Table 4).

Table 3. *Comparisons of student nurses' HIV knowledge scores in the pre- and post-HPCT surveys*

	Pre-HPCT (N=307)			Post-HPCT (N=288)		
	Mean	***SD***	***p*-value**	**Mean**	***SD***	***p*-value**
Overall	15.01	4.069	—	18.22	4.138	.000+
Age group						
18-20 years	14.08	4.456	.001*	17.56	4.487	.006*
≥21 years	15.60	3.781		18.88	3.652	
Gender identity and sexual Orientation						
Straight or heterosexuals	14.73	4.208	.221	18.05	3.801	.074
Sexual and gender minorities	15.53	4.069		19.25	4.173	
Year level						
II	13.49	4.415	.000*	17.14	4.563	.000*
III	16.19	3.481		19.49	3.319	
School location			.000*			.000*
Within NCR	15.96	3.874		20.15	3.239	
Outside NCR	13.65	4.2		16.80	4.161	
Prior HIV education attendance			.001*			.107
No	14.41	4.303		18.24	4.344	
Yes	16.17	3.544		18.14	3.378	

*Note: *significance at α level of .05 using independent t-test, +significant at α level of .05 using paired t-test, HPCT=HIV Prevention and Care Training, NCR= National Capital Region*

Table 4. *Comparisons of student nurses' HIV attitudes in the pre- and post-HPCT surveys*

Items	Pre-HPCT (N=307)		Post-HPCT (N=288)		
	Agree n (%)	Disagree n (%)	Agree n (%)	Disagree n (%)	*p*-value
1. Most people with HIV/AIDS only have themselves to blame.	53 (17.3)	254 (82.7)	47 (16.3)	241 (83.7)	1.000
2. When admitted to hospital, patients who are HIV-positive should not be put in rooms with other patients.	136 (44.3)	171 (55.7)	91 (31.6)	197 (68.4)	.004*
3. When caring for a person with HIV/AIDS, you need to worry about putting your family and friends at risk of contracting the disease.	122 (39.7)	185 (60.3)	76 (26.4)	212 (73.6)	.002*
4. Patients with HIV/AIDS have the right to the same quality of care as any other patient.	300 (97.7)	7 (2.3)	279 (96.9)	9 (3.1)	.424
5. It is especially important to work with patients with HIV/AIDS in a caring manner.	302 (98.4)	5 (1.6)	279 (96.9)	9 (3.1)	.267
6. Patients with HIV/AIDS should be treated with the same respect as any other patient.	304 (99.0)	3 (1.0)	283 (98.3)	5 (1.7)	.453
7. Healthcare workers are worried about getting HIV/AIDS from caring for a person with HIV/AIDS in their work environment.	145 (47.2)	162 (52.8)	108 (37.5)	180 (62.5)	.011*
8. Health care workers are sympathetic towards the misery that people with HIV/AIDS experience.	213 (69.4)	94 (30.6)	197 (68.4)	91 (31.6)	.600
9. Nurses have little sympathy for people who get HIV/AIDS from sexual promiscuity.	53 (17.3)	254 (82.7)	52 (18.1)	236 (81.9)	.665
10. All patients with HIV/AIDS are entitled to confidentiality, even if it puts other people at risk of contracting the disease.	203 (66.1)	104 (33.9)	204 (70.8)	84 (29.2)	.302
Note: **significant at α level of .05 using McNemar's test, HPCT=HIV Prevention and Care Training*					

Table 5. *Comparisons of student nurses' HIV perceived practices in the pre- and post-HPCT surveys*

Items	Pre- HPCT (N=307)		Post- HPCT (N=288)		
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	*p*-value
1. Encourage people to get tested and counseled for HIV/AIDS	283 (92.2)	5 (1.6)	279 (96.9)	2 (0.7)	*.045
2. Refer people for voluntary counseling and testing, even if these services are not available at your workplace	212 (69.1)	26 (8.5)	257 (89.2)	12 (4.2)	*.000
3. Know HIV/AIDS service providers or recognized organization in your area where you can refer your patients to	102 (33.2)	176 (57.3)	266 (92.4)	6 (2.1)	*.000
4. Practice universal blood and body fluid precautions at your clinical duty	191 (62.2)	17 (5.5)	272 (94.4)	1 (0.3)	*.000
5. Wear gloves in taking blood sample	142 (46.3)	1 (0.3)	279 (96.9)	3 (1.0)	*.000
6. Wash hands before examining a patient	263 (85.7)	1 (0.3)	282 (97.9)	2 (0.7)	*.000
7. Recap needles immediately after using them	200 (65.1)	52 (16.9)	232 (80.6)	52 (18.1)	*.000
8. Treat blood spills on floors or other surfaces with a disinfectant before cleaning up	165 (53.7)	13 (4.2)	267 (92.7)	14 (4.9)	*.000
9. Identify if your nursing school or affiliate health facility offers post-exposure prophylaxis	110 (35.8)	44 (14.3)	261 (90.6)	6 (2.1)	*.000
10. Consider starting PEP after an occupationally acquired needle stick injury during your clinical duty	97 (31.6)	15 (4.9)	270 (93.8)	3 (1.0)	*.000
Note: **significant at α level of .05 using McNemar's test, HPCT=HIV Prevention and Care Training*					

HIV perceived practices

Table 5 presents the comparisons of HIV perceived practices of student nurses in the pre- and post-HPCT surveys. Significant differences were observed in the proportions of student nurses who agreed and disagreed in all items of the practice scale pre- and post-HPCT.

Table 6. *Student nurses' evaluation of the online HPCT program*

Items	Mean	*SD*
1. Objectives of the program	4.90	.351
2. Attainment of objectives	4.89	.360
3. Activities are relevant to program	4.88	.371
4. Application of training to nursing practice	4.91	.326
5. Program contains updated information	4.94	.264
6. Flow of the program	4.73	.549
7. Ease of using the online platform	4.72	.608
8. Use of audio-visual presentations and training materials	4.77	.513
9. Availability of training materials	4.79	.526
10. Trainers' mastery of the topic	4.90	.334
11. Trainers' use of teaching strategies	4.81	.449
12. Trainers' willingness to respond to questions	4.92	.301
13. After the training, I get interested in becoming an HIV nurse	4.50	.770
Note: *HPCT=HIV Prevention and Care Training*		

HPCT evaluation

Table 6 shows the mean rating scores of the items in the program evaluation questionnaire. Most student nurses commented that the top three strengths of the program were the knowledge and expertise of the speakers (n=126, 43.8%), followed by the content of the program (n=62, 21.5%), and program delivery and flow of presentation (n=34, 11.8%). The top three comments of student nurses on how to improve the program were about time management (n=43, 14.9%), more engagement of the participants (n=21, 7.3%), and technical preparation (n=18, 6.3%).

Discussion

The online HPCT program significantly improved student nurses' HIV knowledge, attitudes, and perceived practices. The Iowa Model-Revised (Iowa Model Collaborative et al., 2017) helped make the program systematic, meaningful, and setting-based, aligned with the needs of student nurses and the pressing HIV situation in the Philippines. Collaborative engagements, consultations, and pre-program survey analysis were essential steps undertaken to identify current gaps in HIV education among student nurses and how the program should be promoted and implemented. The presence and participation of advocates provided student nurses to hear stories about the realities and challenges in HIV prevention and care.

The findings indicate that the program helped increase further the HIV knowledge of student nurses and equalize it between those with and without prior HIV education attendance. Informing student nurses about basic HIV concepts is fundamental in helping them lessen their fear and anxiety and implement comprehensive and sensitive care for PLHIV. This way prevents them from developing stigmatizing attitudes and discriminatory behaviors that could be barriers in performing comprehensive assessment, establishing nurse-patient interactions, and implementing nursing interventions which are critical components toward compassionate care for PLHIV. Fundamental and updated topics in HIV prevention and control might not have been covered or emphasized in the classes of student nurses (Suominen, 2015), considering that the commonly reported learning about HIV focused on HIV awareness, transmission, prevention, and pathophysiology. These possible reasons may build a gap for student nurses to provide assistance for those needing HIV testing and counseling, use infection control measures efficiently, and promote access to PrEP and post-exposure prophylaxis (PEP) (Khan et al., 2021; Nigatu et al., 2021; Vorasane et al., 2017).

The program was acceptable with high evaluation scores given by the participants. Our varying clinical experience and education and the extensive literature review were vital points to incorporate and interrelate updated and salient topics for the program, emphasizing critical roles and responsibilities in HIV nursing. Our use of frameworks helped us in the selections and transitions of the topics of the program. Although we performed technical rehearsal before the program, technical issues using an online platform could happen (Al-Balas et al., 2020); thus, we adjusted the program's time. Possible consideration on this matter is increasing the duration of the program to allow more discussions and activities while weighing its effect on student nurses' active participation and internet connection when using an online platform. An interprofessional approach can enhance this program for student nurses to learn from different professions, thereby promoting positive learning experiences (Bunting et al., 2019).

There are considerations when it comes to the results of the evaluation of the program. Most student nurses who responded to the pre- and post-HPCT surveys had no prior HIV training attendance. Immediately after the program, student nurses were asked to answer the post-HPCT survey. The HIV practice focused on student nurses' perceptions which may not reflect their actual practice. We did not implement strict screening and monitoring of student nurses who entered the Zoom link in comparison with the list of those who registered. There are possibilities that those who have registered did not attend the program, and others who did not register had entered the Zoom meeting. Technical difficulties, internet connection problems, and other external distractions encountered by student nurses can affect their learning and participation during the program.

Conclusion

Following the steps of the Iowa Model-Revised (Iowa Model Collaborative et al., 2017), we developed, implemented, and evaluated the online HPCT program in a systematic, collaborative, and scientific-based approach. Active consultations among educators, student nurses, and advocates helped us conceptualize the program meaningfully and creatively. We found gaps in HIV-related education and competency among student nurses that are potential barriers to effective HIV prevention and care service deliveries. Variations exist in student nurses' exposure to HIV education, knowledge on developments, guidelines and services in HIV, and perceived practices and attitudes in the care of PLHIV and HIV at-risk populations.

The program was acceptable and beneficial to student nurses' HIV knowledge, attitudes, and perceived practices. Further evaluation is needed to assess the translation of learning into actual clinical practice, and an interprofessional approach can be integrated to promote positive learning experiences. There is a need to strengthen basic HIV concepts and integrate HIV developments in the education of student nurses. Shaping HIV-related competencies of student nurses would contribute to strengthening the health workforce in the Philippines to achieve global HIV targets.

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