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VISION-MISSION STATEMENT

San Beda University, a Catholic educational institution, is committed to the Christian formation of the Bedan Community as its service to the Church, the Philippine society, and the world.

VISION

San Beda University envisions a Community that is:

Fully Human
Wholly Christian
Truly Filipino
Globally Competitive

MISSION

San Beda University aims to form its members in:

Faith (Fides)
Knowledge (Scientia)
Virtue (Virtus)

and inculcate in them the Benedictine core values of prayer and work (ora et labora) that include:

Study
Community
Pursuit of Peace

EDITORIAL

Is caring the same as nursing?

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The various definitions associated with caring make it both an elusive, and interesting concept. Depending on what theoretical or philosophical perspective you take, it may be seen as a human trait, an effect, a moral imperative, a therapeutic intervention, or an interpersonal interaction (Morse et al., 1991). With this diversified take on caring, it seems that we have neither fully defined it as a fixed concept, nor had we exhausted our means to delimit its boundaries.

The prevailing question of who owns the expertise of caring is often asked among the various health care professions as caring appears to encompass every action of their practitioners. If caring is seen as a basic human trait (Morse et al., 1991), a human mode of being (Roach, 2002), or an expression of humanness (Boykin & Schoenhofer, 1993), does it mean that professional education is unnecessary to learn its concepts and expressions?

Although the human person is innately caring and can care, their expressions of caring differ from one another as these are deliberately learned and shaped by the individual’s life experiences and the meanings they attached to these experiences. The varied expressions of caring together with the individual's narratives are what students bring with them when they choose to be a disciple of any helping and healing professions grounded on caring. It is the responsibility of their discipline to inculcate in them the unique expressions of caring as a reflection of their imitable disciplinary knowledge. The amalgamation of the students’ experiential understanding of caring and their unique disciplinary perspective makes their expression of caring a reflection of their shared humanity and professional identity.

Caring expressions of varied practice-based helping and healing professionals when seen from an outsiders’ perspective may appear identical but each professional’s intent is markedly different. A psychologist's use of psychotherapy, a counselor’s employment of counseling techniques, and a nurse’s process of pattern recognition may all look like an interview session, but they are not. The intent of the practitioner stemming from their distinct disciplinary knowledge and their unique way of expressing the inherent wisdom within their discipline makes their caring action uniquely their own.

Among the diverse professions, caring is most often associated with nursing, but it is not unique to nursing. Nurses do not own exclusivity to the knowledge of caring but how it is actualized and expressed is unique in every discipline. Caring is not unique to nursing but unique in nursing (Roach, 2002). Other helping and healing professions have different ways of actualizing caring, both as an expression of the practitioner's humanness and their disciplinary knowledge and values.

Not all actions of the nurse are expressions of caring in nursing, some that seem reflexive and automatic is more of an expression of their humanness than their discipline. A mother who gives medication to her sick child is caring but she is not doing professional nursing. A nurse who helps an old person cross the street is being a caring person but is not doing nursing. A PhD-prepared psychologist tending to their febrile colleague is caring but is not doing professional nursing.

Nursing actions, as one manifestation of caring, when done outside of nursing situations are not reflective of nursing's unique disciplinary knowledge. Not all caring moments, may it be a short encounter or prolonged interaction, occurs within a nursing situation. Those that occur outside of a nursing situation are mere caring moments, an actualization of the person's good intention. Being mindful, eating properly, maintaining proper hygiene are examples of caring for the self but it is not nursing. Self-care actions are essential and necessary for the survival of the individual and are reflective of the nature of caring as a human trait, and not as a definitive nursing action. If self-care is nursing, then all persons are professional nurses since all persons take care of themselves one way or another.

For caring to be considered as nursing actions, it must be deliberately done as an expression of nursing's unique body of knowledge framed within its disciplinary perspective and must occur within a nursing situation; a space of sacred, momentary, transactional engagement with another person aimed towards their betterment.

Caring and nursing were never synonymous. The confusion may stem from our narrow comprehension of both concepts as mere verbs rather than gerunds, which is further compounded by the repeated claim that nursing is caring without presenting a clear philosophical, theoretical, or logical proposition to support such misinformed assertion. Such a declaration is counter-intuitive and discipline-centric.

All practitioners of the helping and healing profession, with their humanness and disciplinary training, are experts in human and professional caring. Their distinctive disciplinary perspective on caring reflects the notion that our understanding of caring is always imperfect, and its concept is continuously co-evolving with humanity. No discipline or profession owns the restrictive privilege of caring knowledge or the sole expertise in caring expression, not even nursing.

Keywords: Caring, Discipline, Knowledge, Nursing, Profession

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RUDOLF CYMORR KIRBY P. MARTINEZ, PhD, MA, RN
Editor-in-Chief

SAN BEDA UNIVERSITY
JOURNAL of HEALTH and CARING SCIENCES

ORIGINAL RESEARCH

Survival Analysis of Time to Retest for HIV Among Men Who Have Sex with Men from Metro Manila, Philippines: A Single-Center Prospective Study

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Abstract

Background: Regular HIV testing means early detection of the virus and prompt access to treatment. However, factors affecting retesting following receipt of a non-reactive test result are not yet well understood. This study aims to determine the predictors of time to repeat HIV testing among men who have sex with men (MSM) from Metro Manila, Philippines within six months following receipt of a non-reactive test result.

Methods: A prospective study was implemented at a community-based HIV testing and counseling center. A total of 250 non-reactive MSM from Metro Manila and with a recent risk of acquiring HIV were the respondents. At baseline, data on socio-demographic factors were gathered; while at follow-up, repeat test status of each participant within six months after baseline was collected.

Results: Two retests per 1,000 person-weeks were recorded. Mean survival time was 23.93 weeks, 95% CI: [23.18 - 24.68]. Cox proportional hazards regression demonstrated that statistically significant factors of time to retest were age (HR = 0.90, 95% CI [0.85, 0.96]) and number of tests in lifetime (HR = 1.12, 95%CI [1.06, 1.18]).

Conclusion: Although the average time to return is within the recommended period of three to six months, the low return rate suggests the call for encouraging repeat HIV testing among MSM with non-reactive results and recent risk of acquiring HIV. Repeat testing has been shown to be facilitated by age and previous testing history. HIV/AIDS counselors and program administrators can aim for MSM who are older and with relatively low testing history to help meet the global target of ending the

HIV/AIDS global epidemic.

Keywords: *HIV, retesting, men who have sex with men, prospective study, survival analysis*

Introduction

The 90-90-90 target of the Joint United Nations Programme on HIV and AIDS (UNAIDS) calls on countries that by 2020, 90% of persons living with HIV (PLHIV) must have known their status, 90% of those diagnosed must have undergone antiretroviral therapy (ART); and 90% of those undergoing ART must have reached viral suppression (UNAIDS, 2014). Achieving these targets have been projected to eliminate the global AIDS epidemic by 2030.

Based on the 90-90-90 target, HIV testing is suggested to be the initial step to achieve the elimination of the epidemic. At the individual level, evidence suggests that early HIV detection and prompt treatment is likely to increase the life expectancy (Dilernia et al., 2010) and mitigate mortality (Davis et al., 2013). This is because PLHIV can have undetectable and have untransmittable viral load after consistent treatment, thereby making their risk of sexually infecting others negligible (UNAIDS, 2018). Meanwhile, at the community level, identification of cases can help illuminate disease prevalence (Tenny & Hoffman, 2020). These benefits implicate the importance of having timely and routine testing for HIV among those who are at risk of acquiring HIV infection because, through repeat tests, one can early identify his or her status. From a programmatic perspective, understanding repeat tests are important because it can shed light on the efficacy of testing and counseling strategies (Puljić et al., 2014).

Literature is suggesting that there is an HIV epidemic among Filipino men who have sex with men (MSM) (Ross, et al., 2015; Gohil et al., 2020). The World Health Organization (2010) recommended those with indeterminate status, those who have a previous and ongoing risk of acquiring HIV, and key populations including MSM to undergo repeat voluntary counseling and testing (VCT) as repeat testing for HIV is not recommended for the general population. In addition, the US Centers for Disease Control and Prevention (2018) suggested that sexually active gay or bisexual men may benefit from a more frequent HIV testing specifically every three to six months.

Foreign literature about predictors significantly related to HIV testing is vast. Studies have seen the significant relationship of HIV testing with socio-demographic variables such as age, socio-economic status, education, geographic distance, and marital status. On the other hand, there were studies that highlighted behavioral factors such as HIV testing history and engagement in unprotected sex.

Also, knowledge of repeat testing is limited (Harichund et al., 2019); and local studies about it have not yet been conducted. Investigating retesting behavior among at risk groups will guide health administrators and decision makers for VCT interventions. In the Philippines, the Department of Health (DOH, 2019) reported that the majority of the new HIV infections are through male to male contact; and in terms of distribution, the new cases tend to come from Metro Manila. Thus, this study sought to shed light on repeat VCT for HIV among Metro Manila-based MSM who tested non-reactive for HIV antibodies. Particularly, this study aims to identify the factors related with time to repeat test following receipt of a negative HIV test result in order to identify groups who can be targeted in the promotion of timely and regular testing.

Methods

Research Design

A prospective study was conducted at a community-based HIV testing and counseling center in Mandaluyong City, Philippines.

Research respondents

MSM from Metro Manila, Philippines were the focus of the study since new cases of HIV infections are skewed against this population and the said region. MSM who attended the HIV testing and treatment facility for VCT and received a non-reactive test result were recruited to participate. HIV/AIDS counselors invited their MSM clients who received a non-reactive HIV test result to participate in the research after post-test counseling. The method of asking MSM who receive non-reactive HIV test results might be prone to selection bias; thus, the counselors were offered a script for standard communication with clients. Once expressed interest, the principal investigator came inside the counseling room, explained further the details of the research, and provided screening of participants to determine eligibility for study participation.

In terms of eligibility, the client must be 1) biologically male who is sexually experienced with other men, 2) at least 18 years of age, 3) studying, working, or residing in Metro Manila, 4) willing to provide contact information for the follow-up data gathering, and 5) engaged in any of the following for the past twelve months - a) unprotected sex, b) multiple anal sex partners, c) multiple oral sex partners, d) sex under the influence of alcohol, e) sex under the influence of drugs, or f) trading money for sex (i.e. bought or sold sex). MSM who were part of other projects in the study site requiring regular follow-up tests were excluded because they will automatically have a retest record. MSM who were anticipating leaving the National Capital Region (NCR) were also excluded. This will also help minimize the bias of changing location with the subsequent test. Invitation and screening stopped when the target sample size had been achieved. Sample size (n) was calculated using the formula:

$$n = \left(\frac{Z_{\frac{\alpha}{2}}}{B}\right)^2 p(1-p)$$

The target sample size was achieved with a 7% margin of error (B) and 95% confidence level. Since no local studies have been identified to examine retesting rates, the study used 50% as proportion (p) in order to minimize bias and to generate the maximum sample size yielding 196 (n). However, due to anticipated attrition among recruited participants, it was increased by 25% (i.e. 46), having a final sample size of 250.

Data and method

A pre-tested questionnaire in English was administered to the eligible clients for self-administration. Monthly income was asked directly in the pre-test; however, as many participants skipped it, it was transformed into a categorical variable in the final questionnaire to increase the item response rate.

At baseline, the self-administered questionnaire containing questions about socio-demographic characteristics, testing history, and preferred mode of communication for follow-up was given to the research respondents. Data on engagement in unprotected sex was unearthed from the screening questionnaire. Participants were instructed that if they will repeat their test in the study site within six months, a drop box will be available containing envelopes, each containing a follow-up questionnaire.

A drop box was also placed at the other branch of the testing center in Pasay City since clients might get a repeat test at this branch. For security, no identifying questions were asked in the follow-up questionnaire; and the drop boxes were checked regularly by the respective point person of the research in each site. To link the repeaters with their baseline questionnaire, their Unique Identification Code, a set of letters and numbers unique to the participant, was asked in the follow-up questionnaire. The follow-up questionnaire inquired about the branch they were having the retest as well as the date of the repeat test. After six months following the baseline test, participants who had no records of repeat tests in the clinics were contacted and asked if they had a repeat test elsewhere. Records of the two study sites were also checked for data validation.

The dependent variable was time-to-retest. Number of weeks from initial test to retest was computed, with non-repeaters having 28 weeks (i.e. maximum duration of study participation of six months plus one week allowance) as time value. In terms of status, a participant was coded “1” if he returned within 28 weeks after baseline VCT, otherwise, “0”. Participants who were lost to follow-up were right-censored and were coded “0” too. Since the recruited MSM are not part of any HIV-related projects requiring regular testing, it is assumed that all returns for another test are under one’s volition.

The variables that were included in this study were informed by a literature review of predictors of HIV testing. Continuous predictors were age in years and number of tests in lifetime (including the VCT on the date of recruitment). Binary categorical predictors were relationship status (in an any form relationship or not) and engagement in unprotected anal sex for past twelve months (yes or no). Multi-category variables include education (elementary level/graduate, high school level/graduate, college level/graduate, post-graduate level/graduate, or technical/vocational), sexual orientation (exclusively or more attracted to the opposite sex which was coded heterosexual, equally attracted to both sexes which was coded bisexual, or exclusively or more attracted to the same sex which was coded homosexual), and monthly income (less than 10,000 Pesos, 10,001 to 20,000, 20,001 to 30,000, 30,001 to 40,000, 40,001 to 50,000, and above 50,000). Present address was also asked directly but was categorized into District 1, 2, 3, or 4, or outside NCR (for those who work or study in NCR but residence is outside of it).

Data analysis

R 3.6.2 (R Core Team, 2019) was used to perform analyses of data. Descriptive statistics were computed first to provide a profile of the participants. To determine if distribution of percentages in follow-up significantly depart from baseline, Chi-Square Goodness of Fit test was performed.

A Kaplan-Meier curve was performed to illustrate and estimate the average time to retest in weeks. A Kaplan Meier curve shows the probability of an event (i.e., the time to retest) at a certain time interval. On the other hand, a Cox proportional hazards regression model was generated to determine factors of time to retest. A Cox proportional hazards regression analysis is a survival analysis that measures the probability of respondents suffering the event of interest, given that the participant has survived up to a specific time. This analysis utilized the package for survival analysis in R (Therneau, 2015). Education was dropped in the regression analysis due to low variability in frequency distribution. Since MSM who had anticipated change in residence were excluded, location was not treated as time-dependent covariate. The study used a 5% level of significance.

Ethical clearance

Prior to data gathering, a technical and ethics review was obtained from the University of the Philippines Manila Research Ethics Board (Code: 2018-021-01). All participants received full information about the study and was issued an informed consent form which would indicate voluntary participation when signed. All data were treated with utmost confidentiality and participants were kept anonymous. The study adhered with the Philippines' Data Privacy Act of 2012.

Results

Table 1 presents the percentage distribution of the socio-demographic characteristics of the recruited respondents.

Table 1. Profile of Respondents

	Baseline (n = 250)		Follow-up (n = 209)		p-value
Variable	frequency	%	frequency	%	
Age (in years)					.94
18 to 22	61	24.40	52	24.88	
23 to 26	94	37.60	80	38.28	
More than 26	95	38.00	77	36.84	
	$\bar{x}$ = 26 (SD = 4.39)		$\bar{x}$ = 26 (SD = 4.19)		
Testing history					.82
1 to 2	128	51.20	103	49.28	
3 to 4	57	22.80	51	24.40	
More than 4	65	26.00	55	26.32	
	$\bar{x}$ = 4 (SD = 3.30)		$\bar{x}$ = 4 (SD = 3.32)		
Monthly Income (in PhP)					.99
< 10,000	32	12.80	26	12.44	
10,001 to 20,000	65	26.00	53	25.36	
20,001 to 30,000	77	30.80	69	33.01	
30,001 to 40,000	37	14.80	30	14.35	
40,001 to 50,000	15	6.00	13	6.22	
> 50,000	24	9.60	18	8.61	
Educational Attainment[a]					.88
Elementary level/graduate	1	0.40	1	0.48	
High school level/graduate	6	2.40	3	1.44	
College level/graduate	224	89.60	190	90.91	
Post-graduate level/graduate	14	5.60	11	5.26	
Technical/vocational	5	2.00	4	1.91	
Present Address					.97
Outside NCR	20	8.00	18	8.61	
District 1 (Capital)	18	7.20	16	7.66	
District 2 (East)	129	51.60	104	49.76	
District 3 (North)	17	6.80	16	7.66	
District 4 (South)	66	26.40	55	26.32	
Relationship status					.29
Single	206	82.40	178	85.17	
In an any form of relationship	44	17.60	31	14.83	
Sexual orientation					.61
Heterosexual	13	5.20	8	3.83	
Bisexual	80	32.00	65	31.10	
Homosexual	157	62.80	136	65.07	
Condomless anal sex for the past 12 months					.50
Yes	168	67.20	145	69.38	
No	82	32.80	64	30.62	

[a] *Elementary and high school levels were combined in the analysis since there was a detected violation of assumption in the original categories.*

At baseline, mean age of the participants was 26 years (SD = 4.39). Typically, monthly income falls between 20,001 to 30,000 (31%) which was slightly followed by the 10,001 to 20,000 income range (26%). Almost all of the participants had at least college level education where about 90% has entered college while 6% has reached postgraduate level. Slightly more than half of the participants (52%) came from the Eastern district of NCR while about a few (8%) reside outside Metro Manila. Eight out of 10 (82%) were single; and most of the participants were exclusively or more attracted with the same sex (63%). More than half of them had unprotected anal sex for the past twelve months (67%). Finally, the average number of HIV tests conducted in lifetime was four (SD = 3.30).

It might appear that the distribution of participants is skewed in some categories; however, the recruited participants had similar characteristics with the Metro Manila MSM and transgender respondents of the 2015 Integrated HIV Behavioral & Serologic Surveillance (DOH, 2015) in terms of age, relationship status, and engagement in unprotected anal sex. In terms of location, the distribution of the participants' current addresses reflect the 2015 census (Philippine Statistics Authority, 2016) that the Eastern district is the most populous in the region. Characteristics of participants who remained at follow-up did not significantly depart from baseline profile (p > .05). Figure 1 and Table 2 shows the survival times gathered from respondents.

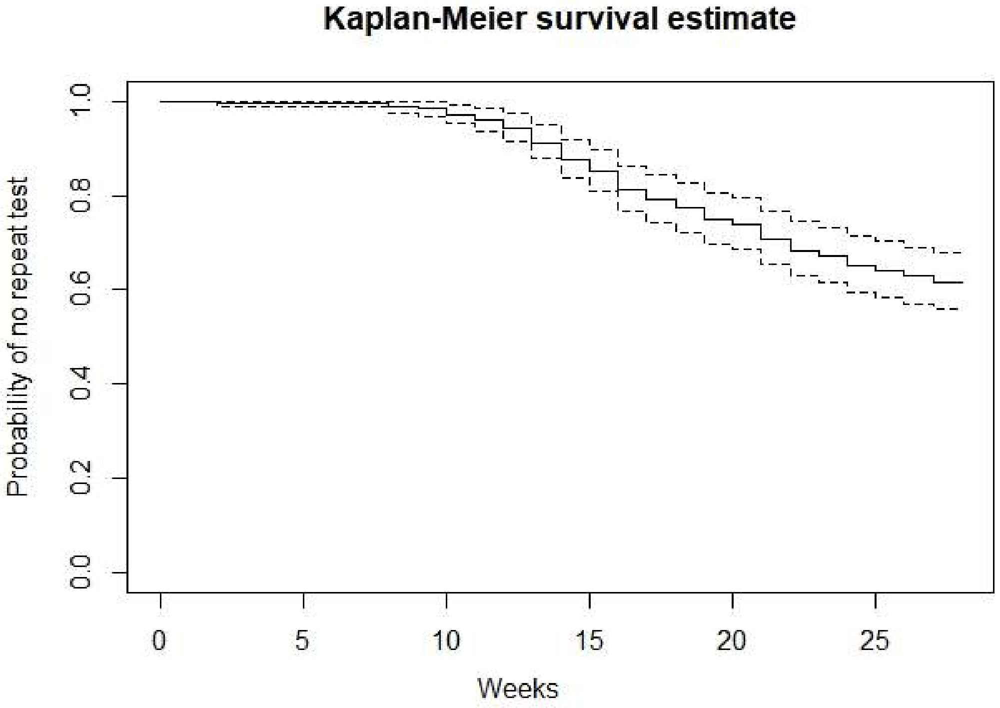

Figure 1. Kaplan-Meier curve of participants with no repeat tests

Table 2. Kaplan-Meier estimates of participants who did not take HIV repeat test

Time t_i (weeks)	Number of remaining participants	Number of clients who took a retest	Kaplan-Meier estimator			
			S(t_i)	SE	LL	UL
2	250	1	1.00	0.00	0.99	1.00
8	249	2	0.99	0.01	0.98	1.00
9	247	1	0.98	0.01	0.97	1.00
10	246	3	0.97	0.01	0.95	0.99
11	243	3	0.96	0.01	0.94	0.99
12	240	4	0.94	0.01	0.92	0.97
13	236	8	0.91	0.02	0.88	0.95
14	228	9	0.88	0.02	0.84	0.92
15	219	6	0.85	0.02	0.81	0.90
16	213	10	0.81	0.02	0.77	0.86
17	203	5	0.79	0.03	0.74	0.84
18	198	5	0.77	0.03	0.72	0.83
19	193	6	0.75	0.03	0.70	0.80
20	187	2	0.74	0.03	0.69	0.80
21	185	8	0.71	0.03	0.65	0.77
22	177	6	0.68	0.03	0.63	0.74
23	171	3	0.67	0.03	0.62	0.73
24	168	5	0.65	0.03	0.60	0.71
25	163	3	0.64	0.03	0.58	0.70
26	160	3	0.63	0.03	0.57	0.69
27	157	3	0.62	0.03	0.56	0.68

From the 250 participants, 96 participants were known to undergo a repeat VCT for HIV within the study duration. Between baseline and follow-up, 96 retests out of 5,982 person-weeks or two repeat tests per 1,000 person-weeks were recorded. Forty-one participants were not reachable and were lost to follow-up. This MSM along with those who did not undergo a repeat test and were lost to follow up were right-censored.

More repeat tests were initiated somewhere 12 weeks after baseline tests. The median survival time cannot be calculated since less than 50% of the participants were observed to repeat a test; however, on average, survival time was 23.93 weeks, 95% CI: [23.18 - 24.68]. The Kaplan-Meier curve also shows the participant's probability of not taking a repeat test during the 28-week period. With respect to repeat testing after three to six months, data reveal that the probability that a client will not take a repeat test in at least 12 weeks (three months) is about 90%; while in at least 24 months (six months), the probability decreases to about 60%. Table 3 presents the computed Cox regression coefficients.

Table 3. Cox regression coefficients predicting time to retest (n = 250)

Variable	Hazard ratio	Std. Error	95% CI		p-value
			LL	UL	
Age	0.90	0.03	0.84	0.96	< 0.01
Testing history	1.12	0.03	1.06	1.18	< 0.01
Income < 10,000			Referent		
Income 10,001 to 20,000	1.00	0.38	0.48	2.10	.99
Income 20,001 to 30,000	1.82	0.37	0.88	3.77	.11
Income 30,001 to 40,000	1.30	0.46	0.53	3.18	.57
Income > 40,001 to 50,000[a]	1.48	0.46	0.60	3.63	.40
Present address outside NCR			Referent		
Present address District 1 (Capital)	0.77	0.55	0.26	2.28	.64
Present address District 2 (East)	0.90	0.39	0.42	1.94	.79
Present address District 3 (North)	0.87	0.52	0.31	2.41	.78
Present address District 4 (South)	0.69	0.43	0.30	1.59	.38
Relationship status (Single)			Referent		
Relationship status (In a relationship)	0.66	0.31	0.36	1.21	.18
Sexual orientation (Heterosexual)			Referent		
Sexual orientation (Bisexual)	1.36	0.62	0.40	4.60	.62
Sexual orientation (Homosexual)	1.68	0.61	0.51	5.58	.39
Condomless anal sex (No)			Referent		
Condomless anal sex (Yes)	0.98	0.24	0.61	1.56	.93

[a] *The last two categories of income level were merged due to relatively lower frequencies, thus avoiding inflated coefficients.*

Out of all the tested predictor variables, only age and testing history were revealed to be statistically significant. Controlling for other variables, the probability of repeat test falls by 10% for every additional year of participant's age, on the average (HR = 0.90, 95% CI [0.84, 0.96]). Conversely, it was seen that as testing history increases, the hazard increases by 1.12 times at any point in time (HR = 1.12, 95%CI [1.06, 1.18]).

Discussion

The Philippines is facing an alarming rate of HIV incidence (Gangcuangco et al., 2013). According to the DOH (2019), in September 2019 alone, there were 1,038 newly confirmed persons living with HIV. Ninety-five percent of whom were men. Mean age was 28 years old and half of the cases belong to the 25 to 31 age cohort. The most predominant mode of transmission was sexual contact (97%) and among the new cases, more than half (59%) was reported to be via male to male transmission.

HIV testing is considered a method of preventing further infections since individuals who know their HIV-positive status can have the virus sexually untransmittable once they have undergone management of viral load. Routine and timely testing is important because linkage to care becomes early once the virus has been detected.

In this study, age has been found to be a significant variable. Studies differ in terms of the relationship of age with HIV testing. Some indicate that older individuals are more likely to get tested than younger ones (Andrews, 2011; Conserve et al., 2013; Peltzer & Matseke, 2013; den Daas et al., 2016). However, an opposite relationship was provided by De Allegri et al. (2015) where individuals aged 20-24 years were more likely to get tested relative to other age groups. Similarly, Norman & Gebre (2005) reported in their study that the youth were more likely to report past HIV testing. In this study, retesting falls as age increases. This corroborates the study of Duffus et al. (2009) that older adults are more likely to be late testers. One possible explanation for this result is that the one provided by Brown et al. (2018) in their study where they stated that there is a belief among older adults that they were not at risk of acquiring HIV; thus, they were less likely to be willing to get tested for HIV. The conflicting result of this study with other studies that found age to be significant also can be attributed to how age was handled in the study. In the present paper, it was treated as a continuous variable rather than categorical to avoid loss of power (Frøslie et al., 2010).

In this study, testing history also significantly predicts time to retest. Burchell et al. (2003) in their study on inmates revealed that testing while incarcerated in the past year was independently associated with previous HIV testing. This can be explained by frequency of behavioral performance being able to account for variance in later performance (Ajzen, 2002). Much empirical evidence has supported past behavior as a determinant of future behavior and the strong relationship between the two corroborates temporal stability of the particular behavior and its antecedents (Ajzen, 2011).

The study has identified age and testing history as significant predictors of time to retest. Other variables did not emerge as significant predictors which can be explained by the fact that the other studies which found the insignificant predictors as significant had different social, political, economic, and cultural contexts. Evidence suggests that HIV/AIDS counselors and administrators can target MSM who are older and those with relatively low testing history for routine testing. Although this study cannot point what particular message can be delivered as this beyond the scope of this research, there are available tools that can be used for counseling; but these should be translated in terms of the situation of the client for cultural appropriateness. As WHO (2015) puts it, counselors must provide messages that are responsive and tailored to the situation of the clients.

This study is not one without limitations, and it is best to understand the conclusion while taking precautions of the study limitations. First, the focus of this paper revolves around socio-demographic and a few behavioral variables. It does not provide information on the role of psychological factors towards repeat testing. The use of factors beyond demographic variables as test variables is suggested for future studies. Second, the effect of changing one's location might have affected retesting status. Data on change on residence were not retrieved at follow-up; however, to eliminate potential bias, MSM who had anticipated change in location was screened out. Future similar studies can take into consideration change of residence because one might have retested because of becoming nearer or farther to a testing facility after location change. The reasons for repeating the test or not is beyond this current research. MSM who did not return for a repeat test might have engaged in protective behaviors and might have perceived that a repeat test is no longer necessary. Therefore, our recommendations are anchored on the assumption that the recruited participants are in an ongoing risk and future research can explore this limitation. Finally, the respondents were MSM from Metro Manila who were recruited at a single site only. Results may not be true to other key populations like injection drug users and other MSM from other regions. Results can only be applicable to Metro Manila MSM with non-reactive HIV test results and with recent risky sexual behavior. Multi-center studies are suggested to strengthen external validity. Having more gathered information, larger sample sizes are also recommended because such can unearth significant relationships if these indeed exist (Thiese et al., 2016).

Conclusion

The low rate of repeat tests among MSM suggests strengthening promotion of routine and timely testing among MSM. HIV/AIDS counselors being the first line of individuals testers face upon learning of tests results should promote messages that target MSM who are older and those with relatively low testing history to promote regular and timely testing.

Conflict of Interest

The authors have no conflict of interest to declare

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Author Contribution

Samuel Brando H. Piamonte: Conceptualized the paper, collected the data and wrote the paper. Jhoanne C. Ynion: Performed the analysis, assisted in writing the paper

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ORIGINAL RESEARCH

Initial Reliability and Validity Testing of the DESTINY Stroke and Large Vessel Screening Tool

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Abstract

Background: Screening is a valuable tool in emergency medicine for triaging, activation of protocols, and resource allocation. The Dallas Emergency Department Screening Tool to Identify Stroke (DESTINY) was developed to screen for all stroke subtypes, with improved sensitivity for posterior circulation stroke and large vessel occlusion (LVO). The main purpose of this study was to evaluate how reliably the tool could be taught and used by ED Nurses.

Methods: This is Phase 1 of a multi-phase study to evaluate the DESTINY tool. A vascular neurologist retrospectively reviewed 409 stroke code activations between January and December of 2018. Thirty descriptive vignettes were composed: right anterior circulation stroke (n=5), left anterior circulation stroke (n=5), posterior circulation stroke (n=5), TIA and stroke mimic (n=6), non-LVO stroke (n=5), and hemorrhagic stroke (n= 4). Fifteen emergency medicine registered nurses used the DESTINY tool to screen the vignettes following the stroke education and DESTINY training module.

Results: Individual Pearson Correlation Coefficients (PCC) were calculated for each nurse compared to the vascular neurologist (range: 0.43860 to 0.96966; mean: 0.8746 ± 0.1484). All individual PCC were statistically significant except for one [PCC of 0.43860 (p = 0.0153)]. Cronbach's Alpha scores were very similar across multiple raters (standardized alpha for nurse raters: 0.9853). Omnibus test to compare DESTINY scores by stroke type demonstrated left anterior LVO and mimic/TIA stroke had few outlier observations, however, poorly differentiated hemorrhagic from ischemic stroke.

Conclusion: As demonstrated by high interrater reliability, the DESTINY tool can be effectively taught to ED nurses using clinical vignettes. The DESTINY tool is good at differentiating non-LVO, anterior LVO, mimics, and TIAs; while the ability to distinguish between anterior LVO/posterior LVO and ischemic/hemorrhagic stroke was sub-optimal. Utilizing the lessons learned in the early version of the DESTINY screening tool we expect that the high-reliability scores will continue to improve in future prospective studies.

Keywords: *stroke, large vessel occlusion, screening tool, validity, reliability*

Introduction

The incidence of acute ischemic stroke (AIS) remains high and is among the leading causes of disability and mortality in the United States and worldwide (Benjamin et al., 2019; Krishnamurthi et al., 2013). The presence of a large vessel occlusion (LVO) has been associated with significantly worse outcomes (Zhu et al., 2014), increasing the odds of mortality by 4.5-fold within 6 months (Smith et al., 2013). Meanwhile, the absence of LVO increases the odds of a good outcome measured by the modified Rankin Scale (mRS) within 6-months (Smith et al., 2013). The most recent guidelines clarify that thrombolytic therapy (e.g. Alteplase or Tenecteplase) be given even when endovascular thrombectomy is planned (Powers et al., 2019). Due to the suboptimal rates of recanalization of a LVO following the administration of intravenous (IV) alteplase and the superiority of thrombectomy combined with best medical management, guidelines have adopted EVT as the standard treatment in eligible patients with LVO up to 24 hours from the last known well (LKW) (Powers et al., 2019; Lawrence et al., 2018). Hence, early identification of LVO is critical for proper treatment selection and triage (Hill et al., 2020).

Despite some terminology variation, the most common definitions of LVO include the internal carotid artery (ICA), proximal middle cerebral artery (M1), distal middle cerebral artery territory (M2), and basilar artery (BA). Additional arterial territory with variable acceptance as LVO includes the vertebral artery (VA), posterior cerebral artery (PCA), and anterior cerebral artery (ACA). Screening for LVO currently includes neurological assessment, CT angiography, and MR angiography (Ver Hage et al., 2018; Beume et al., 2018; Lakomkin et al., 2019; Rennert et al., 2019). Depending on the classification used, angiographic studies have shown that LVO accounts for 31-46% of ischemic strokes and 13% of transient ischemic attacks (TIA) (Smith et al., 2009; Beumer et al., 2016).

EVT treatment benefits diminish as the time between stroke onset and treatment increases. Ergo it is important that stroke systems of care rapidly identify patients with a LVO in the prehospital setting for proper triage of these patients to the highest level of care. Time is lost when a patient with a LVO is transported to a lower-level stroke facility that lacks the resources to provide the necessary treatment (Teleb et al., 2017). Currently, emergency medical services (EMS) first responders perform one screening tool to identify stroke and then apply a second stroke severity tool to identify those patients most likely to have a LVO. Although there are numerous assessment tools used to predict the presence of LVO in stroke patients, a systematic review showed that some instruments did not predict LVO with both high sensitivity and high specificity (Smith et al., 2018). Additionally, many of the stroke severity tools have low sensitivity for posterior circulation strokes. As such, more prospective studies were recommended to assess the accuracy of LVO prediction instruments (Powers et al., 2019; Smith et al., 2018)

The National Institutes of Health Stroke Scale (NIHSS) is widely used as a clinical assessment tool to evaluate the severity of stroke patients, predict patient outcomes, and determine appropriateness for treatment. The NIHSS objectively quantifies stroke impairment on a 0 to a 42-point scale and ranks the severity of the stroke from minor to moderate to severe. Patients with a LVO have a higher NIHSS score compared to those without and are associated with a 7.8-point increase (Smith et al., 2009). However, NIHSS is only a low predictor of LVO, as the tool was not intended to screen for LVO but to quantify the severity of the stroke. The precision of NIHSS in screening for LVO is low, especially when the NIHSS is less than 20 (Beumer et al., 2016). Additionally, the NIHSS takes regular training to perform accurately and is more time consuming than the rapid assessment tools used in the field.

Much like in the prehospital setting, relying on the NIHSS as a rapid assessment can lose valuable time and sensitivity in the Emergency Department (ED) when attempting to quickly identify stroke, mobilize the appropriate teams, and outline the imaging necessary for work-up. A patient suspected of having an AIS with or without LVO in the early and late window necessitates different imaging modalities. Thus, there is the potential for increased radiation and contrast exposure when these studies are not performed discriminately. As the expectation for performance metrics increases, it becomes harder to hit the target times without having imaging that is performed within minutes from the patient arriving at the ED. Thus, a rapid triage assessment tool that can identify the type of stroke, predict LVO, and has appropriate sensitivity for posterior circulation strokes could save time in the ED and facilitate faster treatment times.

Methods

The Dallas Emergency Department Screening Tool to Identify Stroke (DESTINY) was developed as a rapid assessment tool to screen for all strokes while having improved sensitivity for posterior circulation stroke as well as identify those caused by LVO. Approval for this phase 1 study was obtained from the Local University Institutional Review Board. Prior to developing the DESTINY screening tool, commonalities, and differences among stroke assessment tools were reviewed by physicians and nurses in vascular neurology, interventional radiology, neurosurgery, and emergency medicine. From these instruments (Table 1) key items were retained, new items were added, and then organized for flow. Mock-up instruments were field-tested by asking ED nurses to complete the tool as if they were assessing a patient (e.g., imagine your last stroke patient and complete this tool). The final DESTINY instrument was then made available in print form.

Table 1. Previous stroke assessment tools used, and new elements of DESTINY

Scales	What was used for DESTINY
NIHSS	Used as control
VAN[12]	Facial palsy, limb weakness, neglect
CPHSS[17]	Difficulty controlling a limb, speech disturbance; arm weakness
ROSIER[18]	Seizure activity, speech disturbance, vision loss
CSTAT[19]	Arm weakness, gaze deviation, level of consciousness/following commands, hemi sensory loss
New in DESTINY	Pain as chief complaint, Did symptoms resolve, symptoms start with headache sudden onset, loss of balance chief complaint

NIHSS= National Institute of Health Stroke Scale; VAN=Vision Aphasia Neglect; CPHSS=Cincinnati prehospital stroke scale; ROSIER=Recognition of Stroke in the Emergency Room; CSTAT=Cincinnati Stroke Triage Assessment Tool

Case study subjects were developed by a clinical team composed of experts from emergency medicine, vascular neurology, and neurointerventional radiology. Clinicians retrospectively reviewed 409 cases (stroke code activations) between January and December of 2018. From these cases, 30 were selected to represent common diagnoses: right anterior circulation stroke (n= 5), left anterior circulation stroke (n= 5), posterior circulation stroke (n= 5), TIA and stroke mimic (n= 6), non-LVO stroke (n= 5), and hemorrhagic stroke (n= 4). Cases were then written as descriptive vignettes (Figure 1). When information necessary for the DESTINY screening tool was unavailable in the health record best clinical judgment was used to create the summary. The clinical vignettes were de-identified and only the physician investigator and study team creating the vignettes knew the health protected information.

Example of a clinical vignette

"The patient is a 68-year-old woman with a past medical history of hypertension and allergies who presents to the ED on 06/25/2017 at 1642 with sudden onset of L sided weakness while flying from Atlanta to Las Vegas for a conference that started at 1531. The plane made an emergency landing at DFW and she was taken to the community-based hospital.

On exam, her speech is clear. She can state her age and the month correctly. She can name objects appropriately and can follow commands by closing her eyes and open and closing her hand. Gaze is midline. Visual fields are full in 4 quadrants. She has a mild droop to the left side of her face. She drifts the left arm when attempting to hold it up for 10 seconds. She does not feel any touch to the left side of her face, arm, and leg. When both sides of her vision are tested simultaneously she only acknowledges the right side. Finger to the nose is normal."

In total, 15 emergency medicine registered nurses working in an urban area, with experience in treating strokes at a large academic hospital (Clements University Hospital [CUH]) and a community-based hospital (Parkland Medical Hospital [PMH]), volunteered to participate in the study. The volunteers were provided with an education module that focused on stroke, neurological exam and training on the DESTINY screening tool. Following the training, the volunteers were provided the 30 clinical vignettes arranged in random order, de-identified to health protected information as well as the subcategory of stroke etiology. The nurses were instructed to independently review the clinical vignettes and score each case with the DESTINY screening tool. The nurses had one week to return their results. A comment section was provided for the nurses to evaluate the DESTINY screening tool and discuss any areas they found ambiguous or confusing.

The 30 clinical vignettes were scored using the DESTINY tool by 15 emergency department nurses and a physician investigator (MD-PI) stroke specialist. Statistical analysis of the data was done on SAS v9.4 on Microsoft Windows. The scoring produced 16x30 data points that were entered into an electronic spreadsheet. A simple regression analysis was used to attain the Pearson correlation coefficient, which describes the association of the various vignettes scores in predicting the subcategory or stroke etiology.

Results

15 nurses participated in two separate emergency departments. Each nurse scored 30 clinical vignettes such that 450 scored evaluations were included in the analysis. Individual Pearson Correlation Coefficients (PCC) was calculated for each nurse in comparison to the medical provider (MD-PI reference) and ranged from 0.43860 to 0.96966. All individual PCC were statistically significant ($\alpha < 0.005$) except for a community-based nurse with a PCC of 0.43860 ($p = 0.0153$). The average PCC value is 0.8746 ± 0.1484.

Cronbach alpha scores (α) measures the degree to which DESTINY scores were reliably comparable to all raters.[15] Determination of the Cronbach’s alpha score (CAS) used multiple administrations of the same test for different vignettes by different raters. Therefore, this method uses CAS to determine the reliability of DESTINY between various raters, in other words, the interrater reliability. Models were initially constructed to evaluate Cronbach’s Alpha Scores with the physician PI as the reference. The standardized alpha for the nurse raters from the academic hospital and the community-based hospital was 0.9853

Table 2. Pearson's correlations and Cronbach's Alpha Score for Academic and Community Based Urban Hospitals

Hospital Rater	Pearson Correlation Coefficient	p-value
Nurse 1	0.92549	<0.0001
Nurse 2	0.96966	<0.0001
Nurse 3	0.86412	<0.0001
Nurse 4	0.94248	<0.0001
Nurse 5	0.60990	0.0003
Nurse 6	0.94437	<0.0001
Nurse 7	0.93211	<0.0001
Nurse 8	0.93575	<0.0001
Nurse 9	0.87591	< 0.0001
Nurse 10	0.94231	< 0.0001
Nurse 11	0.95519	< 0.0001
Nurse 12	0.91917	< 0.0001
Nurse 13	0.92006	< 0.0001
Nurse 14	0.43860	0.0153
Nurse 15	0.94379	< 0.0001

Pearson correlation Coefficient Mean	0.8746 ±0.1484
PCC Range	0.43860 - 0.96966
Cronbach's Coefficient Alpha	0.985282

A total of 480 observations were used for an omnibus test to compare DESTINY scores by stroke type because each vignette represents a stroke etiology; left anterior LVO n=80 mean= 5.400±1.548, right anterior LVO n=80 mean =5.563±1.483, posterior LVO n= 80 mean= 5.400±3.366, hemorrhagic n= 64 mean=4.922±2.651, non-LVO n=80 mean= 2.889±1.49, and TIA n=64 mean=1.667±1.463. Left anterior LVO and mimic/TIA stroke had a few outlier observations

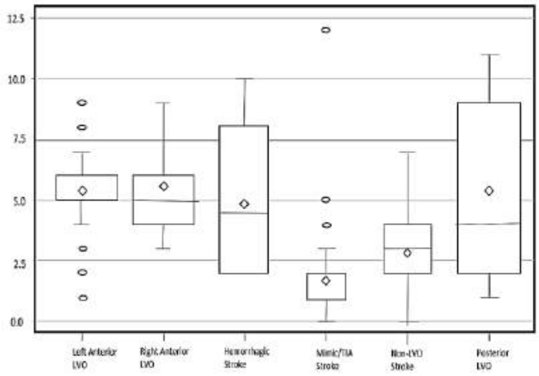

Figure 2. Distribution of scores by diagnostic category
LVO=Large vessel occlusion; TIA=transient ischemic attack

Discussion

Screening tools are valued in the clinical setting for their ability to detect signs of a disease in an individual to reduce the chances for mortality or morbidity. Screening is also a valuable tool in emergency medicine for the triaging, activation of protocols, and resource allocation. Aside from having high sensitivity and specificity for stroke and LVO, an effective screening tool must be one that is simple to perform and teach to providers of various medical backgrounds. The results must then be reliable among clinicians (including EMS, triage nurses, and ED physicians) in a variety of settings. This ensures that the patients are properly triaged promptly to the appropriate care.

The validity of a new tool is dependent on the reliability of the tool (Buelow et al., 2016). Cronbach's alpha score is a widely used objective measure of reliability test to determine the degree of the interrelatedness of test items or raters in an assessment or tool (Tavakol & Dennick, 2011). CAS analysis showed that DESTINY has high internal consistency ($\alpha = 0.985$) indicating that the scores are very similar across multiple raters. Therefore, the DESTINY tool has high interrater reliability when applied to potential stroke patients with a variety of presentations.

As with any new instrument, there is room for improvement. Future modifications will aim to reduce limitations associated with definitions and terminology that were more open to interpretation than we had recognized. These modifications may further enhance internal consistency. Limitations of generalizability are currently being examined as the instrument is now the standard of care at another institution. These data will be evaluated in a future manuscript.

In this retrospective phase 1 study, the tool was shown to be effectively taught to ED nurses who had familiarity with stroke assessment before using DESTINY. The tool was applied to our patient population consistently and reliably. Individual PCCs were all positive and showed a moderate to strong correlation to the MD-PI reference. This indicates how effective the current DESTINY educational teaching module is for raters of different backgrounds. All individual PCC were statistically significant ($\alpha < 0.005$) except for a single PMH-ED nurse (PCC = 0.43860, $p = 0.0153$).

The omnibus test provided the average score ranges between all raters for each stroke etiology. A screening tool with a clear benchmark for each possible stroke type is essential for an improved and rapid stroke care system to achieve appropriate stroke identification, triage, and treatment (Middleton et al., 2015). In this study, the DESTINY tool is good at differentiating non-LVO strokes as well as cases that were not strokes such as mimics and TIAs; DESTINY had good construct validity for non-strokes. Although DESTINY's ability to distinguish between anterior LVO and posterior LVO was sub-optimal, the upper and lower boundaries for anterior LVO is quite adequate for differentiation. However, the DESTINY screening tool poorly differentiated hemorrhagic from ischemic stroke.

The nurses had the opportunity to critique the questions. Based on their evaluations, future modifications to DESTINY address an ambiguous question related to posterior LVO stroke, which was also associated with a higher rate of error in their responses compared to MD-PI reference. Future modifications to DESTINY address the ambiguous language in the screening tool and addressed test items to better differentiate anterior LVO from posterior LVO and ischemic from hemorrhagic stroke. Although, the main intent of the screening tool is to identify ischemic stroke and its subtypes rather than screen for hemorrhagic stroke.

Limitations

One recognized limitation of this study includes only testing the interrater reliability of the DESTINY tool and not comparing it to other published stroke and LVO screening tools. Comparing DESTINY to other screening tools performed by the same examiner would yield a more effective comparison as to the efficacy of DESTINY. This is planned for a future study. Also, our sample included nurses who were already familiar with stroke assessment and future studies should address clinicians with varying degrees of familiarity assessing stroke.

An additional significant limitation of this study is the application of the DESTINY tool to written selected cases for this study. DESTINY was created for the triage of potential stroke patients presenting to an ED in a time-critical period and assessing for high reliability in a live setting would be most fitting. This is the first among several planned prospective studies to evaluate DESTINY in a real-world environment to see if these findings remain robust.

A Cronbach alpha score of 0.9853 is extremely high. It is worth mentioning that Cronbach's alpha is neither a test of dimensionality (unidimensionality or multidimensionality) nor a measure of validity without capturing any confounder. However, it is a strong measure of internal consistency or validity. So a high alpha simply implies high consistency.15 According to the omnibus test analysis, this version of DESTINY can accurately distinguish between stroke mimics/TIA and LVO but shows poor resolution between ischemic and hemorrhagic strokes. This may indicate that DESTINY is measuring LVO in addition to ischemic and hemorrhagic strokes (i.e. multidimensional). Future studies will address this issue and update DESTINY as necessary.

Conclusion

Given the broad nature of stroke patients and their myriad presentations, an ideal stroke screening tool must have high sensitivity and specificity for strokes of all subtypes. DESTINY is a multi-phase study and this study concludes phase 1. The main purpose of this study was to evaluate the usability of the tool and how reliably it could be taught and deployed by ED nurses. The results show that the scores among examiners could be reliable following an educational training module. In this study, the tool was only retrospectively applied to de-identified clinical vignettes from thirty patients representing the varied presentations of stroke. Utilizing the lessons learned and deficiencies in the early version of the DESTINY screening tool, we expect that the high-reliability scores will continue to improve. Future prospective studies will further evaluate for weaknesses inherent in the DESTINY screening tool for identifying stroke and differentiating between the stroke subtypes, as well as the feasibility of applying the prospective tool in a real emergency setting.

Conflict of Interest

The authors have no conflict of interest to disclose.

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Author Contribution

Daniel Nyancho: conceptualization of the study, acquisition of data, analysis of data, drafting of manuscript, critical revisions. **Ryan Cheung**: data acquisition, drafting of manuscript, critical revisions. **Aardhra M. Venkatachalam**: analysis of data, critical revisions. **Folefac D. Atem**: analysis of data, critical revisions. **Sonja E. Stutzman:** conceptualization of the study, data acquisition, drafting of manuscript, critical revisions. **DaiWai M. Olson**: drafting of manuscript, design of the study, interpretation of data, critical revisions. **Deborah Diercks:** interpretation of data, critical revisions. **Mark Johnson:** interpretation of data, critical revisions. **Roberta Novakovic-White:** conceptualization of the study, study design, data acquisition, interpretation of data, drafting of manuscript, critical revisions.

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ORIGINAL RESEARCH

Dengue Vaccine Controversy Awareness, Vaccine Health Literacy, and Vaccine Acceptability among Mothers in Select Rural Communities

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Abstract

Background: Immunization is a vital public health service that reduces the transmission of communicable diseases among population groups. In the Philippines, reports of adverse reactions from the dengue vaccine raised doubts about its safety and efficacy. This in turn can bring about a decline in vaccine acceptability among mothers and later on result in reduced vaccine coverage in the country.

Methods: Descriptive cross-sectional correlational design was used to explicate the influence of dengue vaccine controversy awareness and vaccine health literacy on vaccine acceptability among mothers. Data were collected among 200 mothers from August – November 2018 in rural communities of Bulacan. Stepwise forward and backward multiple linear regression were done to determine the relationships between the variables of interest.

Results: The majority of the mothers who participated belong to the 26-35-year-old age bracket and received a basic education. Mothers' functional health literacy (B=0.189, p=0.006) and critical health literacy (B=0.247, p=0.000) revealed a significant relationship to vaccine acceptability. However, communicative health literacy (B=0.008, p=0.917) showed no significant relationship to vaccine acceptability. Moreover, the dengue vaccine controversy awareness (B=0.057, p=0.415) had no significant relationship with the mothers' vaccine acceptability.

Conclusion: Health literacy favorably influences vaccine acceptability. Likewise, awareness of controversies surrounding dengue vaccination is not a deterrent to the decision of mothers to continue submitting their children to immunization. Hence, nurses should invest more in educational interventions to promote compliance of communities to the national immunization program and engage stakeholders to support its implementation.

Keywords: *Health Literacy, Vaccination, Preventive Health Services, Vaccination Coverage, Public Health*

Introduction

Background

The Philippines as a developing nation has long been struggling with communicable diseases. To help reduce the spread of these conditions particularly among children, the Philippine government launched the Expanded Program on Immunization in 1976 (Department of Health, 2020a). Employing mandatory vaccination of children as the key strategy, the program was aimed at developing herd immunity in the population, thereby preventing unnecessary deaths from common childhood infections. Initially, six vaccines were intended for the prevention of diseases such as tuberculosis, diphtheria, pertussis, tetanus, measles, and poliomyelitis (DOH, 2020). Over the years, the list of biologicals has grown to address the changing epidemiological situation of the country. In 2011, Republic Act 10152 or the Mandatory and Basic Immunization Act was implemented to intensify the public health campaign of protecting vulnerable population groups from various infectious diseases (DOH, 2020). To date, this law is considered as the legal basis of the immunization program in the Philippines and includes vaccines against pneumonia, meningitis, measles, mumps, and rubella. With the successful implementation of the immunization program, the Philippines has significantly reduced the under-five mortality almost meeting the target set in the Millennium Development Goals of the United Nations. Based on the United Nations Children's Fund (UNICEF) 2020 database, the Philippines ' under-five mortality rates has improved from 37.7 per 1000 live births in 2000 to 27.3 last 2019.

In 2016, the Department of Health launched a special mass immunization for children 9 to 14 years of age against dengue hemorrhagic fever. Areas covered were limited to Metro Manila, Central Luzon, and Southern Luzon, as these are the regions with the highest number of reported cases of dengue in the country. However, reports of adverse reactions from the vaccine raised speculations and doubts about its safety and efficacy that led to vaccine hesitancy (DOH, 2018). According to McClure et al. (2017), vaccine hesitancy is demonstrated by increased requests for alternative vaccination schedules or by altogether postponing or declining vaccines Consequently, the drop in vaccine coverage in the country is attributed by health authorities to this controversy. Based on the 2018 report of the Department of Health, the percentage of fully immunized children in the country is at 66%, compared to 75% in 2014.

Nurses account for the majority of the human resource for health in the country. As providers of primary care in communities, public health nurses are in a pivotal stance to mainstream health promotion and health protection activities. The national immunization program (also referred to as Expanded Program on Immunization) significantly reduces the risk of acquiring communicable diseases among children and mothers. To achieve its aim, health literacy and vaccine acceptability are prerequisites. Thus, understanding whether current issues in the country pose negative influences on parents' decisions to submit their children for immunization is paramount. The ability to process and utilize information to improve and maintain one's health is termed as health literacy. The World Health Organization (2016), cites that health literacy of the population is essential to effectively implement public health programs. In a country where the health literacy of the population is a challenge, it is critical for health professionals like nurses to communicate information on the value of immunization. Hence, nurses in public health can better engage communities to avail of various healthcare services to increase their wellness and ultimately achieve better health outcomes.

Aims/Objectives

In line with the situations discussed above, this study investigated the relationship of vaccine health literacy and dengue vaccine controversy awareness with vaccine acceptability (Figure 1).

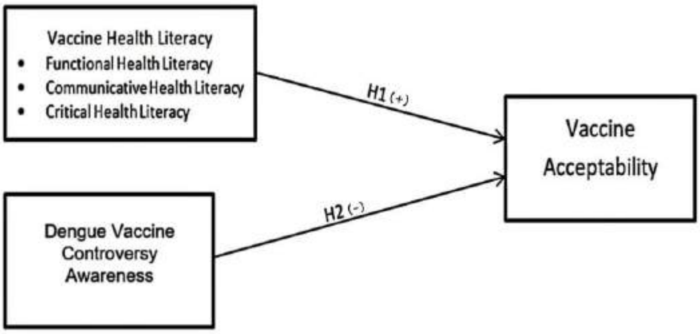

Figure 1. Proposed Model

Methods

Study Design and Setting

A descriptive cross-sectional and correlational design was used to explicate the relationships of dengue vaccine controversy awareness and vaccine health literacy to the vaccine acceptability among mothers.

Being a study in the area of public health, fieldwork was carried out by the researchers in the province of Bulacan. The site was chosen for two main reasons. First, Bulacan is part of Central Luzon which was included in the special mass immunization for dengue last 2016. Second, the proximity of the province to Metro Manila permits free movement of people, goods, technology, and information across borders. Communities specifically from the municipalities of Plaridel and Marilao were chosen due to the existence of community people's organizations in the area that spearhead various health-related activities.

Sampling Technique

Consecutive sampling was utilized among the mothers who visited the rural health unit or health center and met the following inclusion criteria: (1) able to read and write (2) and with children who are six months to five years of age or with children who have been vaccinated by the government under the immunization program of the Philippines. Meanwhile, the following are the exclusion criteria: (1) vulnerable individuals such as pregnant women, minors, prisoners, those with diminished mental capacity, and older adults, (2) those whose children have been included in the dengue special immunization activity, and (3) mothers whose children did not receive any form of vaccination. Consecutive sampling is highly useful when there is limited availability of subjects or when using stringent selection criteria that may threaten the generalizability of the results. A total of 200 mothers consented to participate in the study and sampling adequacy was assessed using post hoc power analysis, reflecting an effect size of 0.093 and an observed statistical power of 0.929.

Research Instruments

Three tools were deployed to measure the variables of interest namely: vaccine acceptability, vaccine health literacy, and dengue vaccine controversy awareness. All instruments were subjected to face and content validity by experts and were pilot tested for reliability testing. Likewise, permission from the primary tool developers was sought. With their consent, the instruments originally devised in English were translated to Filipino. Language experts assisted in accomplishing the translation. The researcher-made Dengue Vaccine Controversy Awareness tool has two-parts: subject demographic profile and questions about the vaccine controversy. The questionnaire is composed of 7 items derived from extant literature with dichotomous options of "yes or no". The tool was pilot tested twice and then modified until it yielded a reliability score of 0.611 which is considered acceptable for newly developed instruments (Taber, 2016). The Vaccine Health Literacy Scale is the second tool used in this study and was adopted from the work of Aharon and colleagues (2016). This instrument is specifically intended to measure the health literacy of mothers regarding vaccines in three domains (functional, critical, and communicative), with 14 items ranked on a Likert scale ranging from 1 = "not at all" to 4 = "very much so". This tool also has good internal consistency (Cronbach's alpha=0.84). The last instrument is the Vaccine Acceptability Scale (Sarathchandra et al., 2018), which was used to determine the parents' acceptability of vaccines. It measures the key facets of vaccine acceptance through agreement or disagreement in five areas namely: perceived safety of vaccines; perceived effectiveness and necessity of vaccines; acceptance of the selection and scheduling of vaccines; positive values and affect toward vaccines; and perceived legitimacy of authorities to require vaccinations. Face validity was determined through three experts and reliability testing showed a result of 0.734. Finally, to ensure the appropriateness of the tools to the subjects, factors such as reading level, length of time, cultural differences, beliefs, and language barriers were all considered by the researchers.

Data Gathering Procedure and Data Analysis

After securing technical and ethical clearance, the researchers made initial contact with prospective communities. Permission from local government authorities was also sought before the actual visit to the sites. A community assembly was then scheduled to meet prospective participants by the community organization based on the established eligibility criteria. However, with a low turnout during the assembly, the researchers conducted a series of home visits after a prior notice was given through local leaders of the communities. On the course of the said home visit, researchers were accommodated in the common area of the household without any other members of their family present. Informed consent was secured after explaining the details of the protocol. Questionnaires were then handed over and were accomplished by the subjects within an average of 30 to 45 minutes. Token of appreciation was provided to the participants at the end of each visit consisting of grocery items to compensate for their shared time and information.

The study utilized the Statistical Package for Social Sciences (SPSS) to perform descriptive statistics to measure the mean and frequency and percentage of continuous and categorical data. Standard deviation (SD) was used to assess the variability of scores. Finally, stepwise forward and backward multiple linear regression was done to determine the relationships among the variables of interest.

Ethical Considerations

The study was conducted with the utmost consideration for the rights of research participants and adherence to the National Ethical Guidelines of Health Research. In particular, the principles of beneficence, justice, informed consent, data privacy, and confidentiality, as well as ensuring social value, and protection of vulnerable populations were observed throughout the conduct of this investigation. Clearance from the researchers' institutional ethics review committee (Protocol Number: USTCON-2018 SR05) was obtained before commencing any fieldwork. Free and prior informed consent was obtained. Subjects are briefed on the nature, purpose, risks/benefits of the study, and that participation is purely voluntary. To ensure the privacy of the family, a household visit was conducted in their receiving area without any other members present. Forms accomplished by subjects were coded and anonymized to maintain confidentiality. Likewise, all forms containing information collected from the participants of the study were secured in a locked filing cabinet.

Result

The demographic profile of the respondents (Table 1) revealed that the majority of the mothers (99.5%) received a basic education, which includes primary and secondary levels. In terms of age, most of the respondents were from the 26–35-year-old age bracket.

Table 1. Demographic Profile (n=200)

	Frequency	Percent
Age		
≤ 20	14.0	7.0%
21 – 25	35.0	17.5%
26 – 30	37.0	18.5%
31 – 35	42.0	21.0%
36 – 40	30.0	15.0%
41 – 45	24.0	12.0%
46 – 50	9.0	4.5%
51 – 55	2.0	1.0%
56 – 60	7.0	3.5%
Educational Attainment		
No formal Education	1	0.5%
Elementary Level	40	20.0%
Elementary Graduate	7	3.5%
High School Level	70	35.0%
High School Graduate	50	25.0%
College Level	22	11.0%
College Graduate	10	5.0%

The level of the mother's awareness of the Dengue vaccine controversy is high with an average score of 4.37 out of 7 questions in the tool. Vaccine health literacy was measured in 3 areas, such as functional, communicative, and critical domains, which reported high mean scores. Aharon (2016) states that a score approximating a value of 4 is interpreted as a high degree of health literacy and a score approximating a value of 1 is interpreted as a low degree of health literacy. Table 2 presents the mean scores for awareness, vaccine health literacy, and vaccine acceptability of the subjects in this study.

Table 2. Mean of Dengue Vaccine Controversy Awareness, Vaccine Health Literacy, and Vaccine Acceptability

	Mean	Standard Deviation
Dengue Vaccine Controversy Awareness	4.37	2.028

	Mean	Standard Deviation
Vaccine Health Literacy	3.23	0.588
Functional Health Literacy	3.14	0.757
Communicative Health Literacy	2.95	0.873
Critical Health Literacy	3.65	0.735
Vaccine Acceptability	5.28	0.896

Respondents' functional health literacy (B=0.189; p=0.006) and the critical health literacy (B=0.247; p=0.000) showed significant relationships with vaccine acceptability (Table 3). Meanwhile, communicative health literacy (B=0.008; p=0.917) had no significant relationship with the vaccine acceptability of the mothers. However, although two categories of health literacy showed a significant relationship on vaccine acceptability, the score for the overall health literacy (B=0.024; p=0.789) showed no significance on vaccine acceptability of the mothers. For the associations between dengue vaccine controversy awareness and vaccine acceptability, no significant relationship (B=0.057; p=0.415) was determined statistically (Table 4).

Table 3. Stepwise Linear Regression of Vaccine Health Literacy to the Mother's Vaccine Acceptability

	Std. Error	Beta	P-Value	Interpretation
Functional HL	0.069	0.189	0.006	Significant
Critical HL	0.069	0.247	0.000	Significant
Communicative HL	0.051	0.008	0.917	Not Significant
Overall Vaccine HL	0.047	-0.024	0.789	Not significant

Table 4. Correlation of Dengue Vaccine Controversy Awareness to Vaccine Acceptability

	Std. Error	Beta	P-Value	Interpretation
Dengue Vaccine Controversy Awareness		.057	.415	Not Significant

Finally, using stepwise regression, the emerging model that reflects the influences of awareness of the dengue vaccine controversy, and health literacy on vaccine acceptability of mothers is shown in Figure 2.

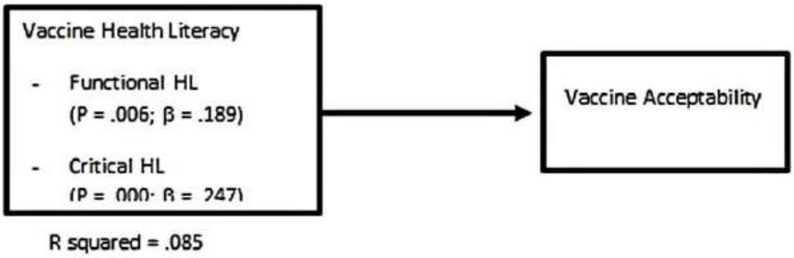

Figure 2. Emergent Model

Discussion

Vaccine health literacy is viewed as the people's attitude and belief towards vaccination to understand the main determinants of vaccine acceptability (Yousif et al., 2013). There are three levels of health literacy in general: functional, communicative, and critical. Functional health literacy is the basic ability of an individual to read and write. Communicative health literacy is the ability of an individual to process health information and know its significance. Lastly, critical health literacy refers to the ability of a person to analyze health information (Aharon et al., 2016). Vaccine information is considered to be complex which is why comprehending information about vaccines requires a certain level of health literacy and skills. This could be a challenge for people who have low health literacy (Lorini, 2018). In this study, the mothers who participated all reported high scores in these areas. This finding may seem odd since most studies showed that higher educational attainment is linked to higher health literacy and ultimately to better health outcomes (Chabra et al., 2015). Also, a higher educational level results in a better understanding of health information among parents than those with lower educational attainment (Yousif et al., 2013). However, the findings of this study state otherwise. The majority of the mothers received only basic education (primary and secondary levels) but they recorded high scores for their vaccine health literacy. At the minimum, individuals at this level are expected to demonstrate the ability to read, write, and comprehend health information. In contrast, Rowlands (2014) suggests that health literacy is a complex concept, ranging from basic skills in reading and numeracy to advanced cognitive skills needed to critically analyze information. Factors that account for this finding may include the respondents' prior experiences of availing healthcare services and access to health information from multiple sources like social media. Information directed to the parents about vaccination against disease, their access to modern mass media, and their socio-cultural behaviors can be major determinants of vaccination compliance (Phimmasane et al., 2010).

Vaccine acceptability of mothers who participated in this study showed significant relationships with functional and critical health literacy. However, the overall health literacy score did not. This gap may be related to how the subjects accomplished the tool due to the time required to finish it or possibly the items for them are already redundant. Still, it is noteworthy to point that in this study, vaccine health literacy positively influences the mothers' acceptability towards vaccines. This means that they have a sufficient understanding of the value of vaccines and that they will utilize this preventive service for the benefit of their children's health.

Immunization is an essential public health service that has prevented common childhood diseases in the country. Over the years, it has been implemented by the Department of Health through local government units as a major contributor to the achievement of reducing under-five child mortality. The cooperation of parents rooted in their confidence in the efficacy and safety of vaccines account for its wide acceptability in communities. However, in the presence of controversies surrounding new vaccines, the risk of non-compliance to immunization programs becomes eminent.

This problem is further exacerbated if parents have a limited understanding of vaccines as reported by Pugliese-Garcia et al. (2018). In 2018, the Philippine Pediatric Society noted an increasing vaccine refusal in the country brought about by the dengue vaccine controversy due to the reported adverse effects attributed to it. As a consequence, there was a marked decline in parents getting vaccinations for their children for other diseases such as pneumonia, measles, polio, and tuberculosis (CNN Philippines, 2018). According to Dube et al. (2015), the adverse events that can result from the vaccines can affect parents' vaccine decisions in general and newly created vaccines usually cause more hesitancy towards vaccination. As such, implementing new vaccines should be coupled with the provision of information tailored for the individual and the vaccine it concerns. (Eilers et al., 2017)

In this study, the mothers demonstrated a high level of awareness of the dengue vaccine controversy. Surprisingly, their awareness is not significantly related to their vaccine acceptability. This is a unique case that runs contrary to most studies highlighting the negative consequence of issues on new vaccines to immunization utility. In other words, the mothers regard the value of immunization as an essential health service that improves the wellness of their children. On one hand, acceptance of vaccination is an outcome behavior resulting from a complex decision-making process that can be potentially influenced by a wide range of factors. Vaccine hesitancy, on the other hand, is complex and context-specific, varying across time, place, and vaccines, and includes factors such as complacency, convenience, and confidence (WHO, 2014). Further, the level of the parent’s education, occupation, number of children, and age of the children are contributing factors in attending immunization services and immunization status of children (Phimmasane et al., 2010). Indeed, previous experiences with vaccination reinforced the respondents’ understanding of the benefit of this health technology. Thus, it can be considered as a key element to explain this unique phenomenon. Valido et. al (2018) stated that among parents, vaccine acceptability commonly results from prior experience with the immunization program and the communication they received from health authorities. Also, the massive information drive promoting the effectiveness of immunization undertaken by the government in response to the controversy contributed to this finding. This echoes the work of Smith et al. (2017), which highlighted the value of communicating information to parents to promote increased vaccine uptake.

Conclusion

The ability to understand, process, and utilize health information supports the acceptance of health services. Such is the outcome of this study that reinforces that health literacy promotes vaccine acceptability of mothers. Awareness of controversies surrounding dengue vaccination is not a deterrent to the decision of mothers to continue submitting their children to the national immunization program. This creates a perfect opportunity for nurses and other healthcare providers to invest in educational interventions that will foster positive health-seeking behaviors among mothers and other population groups. Likewise, it is essential to utilize multiple platforms for disseminating correct health information to communities. Considering the acceptability of vaccines, nurses across all settings should engage stakeholders and decision-makers in government. Nurses should step forward in communicating evidence that will support better funding for immunization services in communities and thereby contribute to better health outcomes. With limitations encountered in this research, future studies are recommended to look into other factors that influence vaccine acceptability on a wider population.

Conflict of Interest

The authors have no conflict of interest to disclose.

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Author Contribution

Earl Francis Sumile: conception and design of the work; analysis and interpretation of data, drafting and critical revision of the paper and the article, oversaw final approval of the study; and accepts accountability on all aspects of the work. **John Howell Diric**: acquisition of data and analysis and interpretation, approving the final study, accountability on all aspects of the work. **Zariah Monica Dorado:** acquisition of data and analysis and interpretation, approving the final study, accountability on all aspects of the work. **Kate Dumaua**: acquisition of data and analysis and interpretation, approving the final study, accountability on all aspects of the work. **Monica Julia Ryen Ecura**: acquisition of data and analysis and interpretation, approving the final study, accountability on all aspects of the work. **Jose Maria Dumaya:** conception and design of the work, including the acquisition of data; analysis and interpretation of data, approving the final study, and accountability on all aspects of the work.

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ORIGINAL RESEARCH

Knowledge, Attitude, and Practices of University Students Towards Covid-19 Prevention

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Abstract

Background: COVID-19 has affected the educational system, particularly students of higher educational institutions. Accurate knowledge about the disease, its transmission, and preventive measures are critical for containing an outbreak. University students, the next generation of professionals, may play an imperative role in propagating key health information to society.

Objectives: The study aims to assess the level of knowledge, the attitude of concern, and prevention practices among university students towards COVID-19 prevention.

Methods: This descriptive study was conducted at a private higher educational institution in Central Luzon, Holy Angel University. 357 university students were recruited as study participants from the university's different departments using the purposive sampling method, and data were collected using an online self-administered questionnaire.

Results: Among the 357 university students who completed the questionnaires, most were females (58.5%). The results show a good level of attitude of concern and good knowledge of clinical manifestations of COVID-19. The students' most frequently stated source of transmission is exposure to coughing and sneezing via droplets. Additionally, wearing face masks was the most reported method of protection against the infection.

Conclusion: The study revealed that university students have adequate knowledge, practices, and attitude of concern towards COVID-19. To bridge the gap between current and required knowledge, it is essential to establish further professional educational campaigns to increase university students' awareness of the pandemic.

Keywords: *coronavirus 2, COVID-19, pandemic, severe acute respiratory syndrome, students, universities*

Introduction

Viral diseases continue to rise and pose a significant public health concern, and several viruses have triggered past global epidemics, such as Severe Acute Respiratory Syndrome (SARS) and Middle Eastern Respiratory Syndrome (MERS) (de Wit et al., 2016). Most recently, an emerging respiratory disease caused by the highly contagious novel coronavirus (SARS-CoV 2) was first detected in December 2019 in Wuhan, China (Zhonghua et al., 2020; Zhu et al., 2020; Zhong et al., 2020). COVID-19 has rapidly spread within the other cities in China and eventually worldwide (Wang et al., 2020); thus, the World Health Organization declared the disease a global pandemic. This new virus has spread rapidly worldwide, affecting 215 countries. As of December 6, 2020, over 66 million cases, and 1,534,344 deaths have been reported globally (Worldometer, 2020).

In the Philippines, the Department of Health's first case was on the 30th of January 2020, a 38-year-old-female Chinese national, and the first local transmission was confirmed on March 7, 2020 (Ramzy & May, 2020). The government has adopted several measures to monitor and control the rapid spread of the country's ongoing COVID-19 outbreak. Currently, there is no available anti-viral treatment for COVID-19. Prevention is the primary method to avoid acquiring the disease (Dhama et al., 2020). Thus, the CDC (2020a) summarized the recommended everyday preventive actions to help prevent the spread of respiratory viruses, which includes the following: (1) Use of face masks; (2) Covering coughs and sneezes using tissue then safely disposed (or, use of flexed elbow); (3) Proper handwashing for at least 20 seconds; (4) Physical distancing from infected people; (5) Refrain from touching the face, especially the mouth and nose, with unwashed hands; and (6) Frequently touched objects and surfaces should be cleaned and regularly disinfected.

COVID-19, as a fast-changing and emerging global health challenge, has impacted all industries since its outbreak in December 2019 (Kassema, 2020; McKibbin & Fernando, 2020). Several studies have been conducted to determine the virological characteristics and clinical effects of COVID-19 (Huang et al., 2020). However, limited studies focused on assessing the knowledge, perceived severity, and controllability of the pandemic. Knowledge and behavioral assessment of such outbreaks are important, particularly because of the massive number of misconceptions and false information circulating on social media about disease transmission and acquisition methods (Mohamad et al., 2020; Geldsetzer, 2020). The management of this pandemic primarily depends on the adherence to the recommended measures taken. For any health preventive measures to be beneficial, a thorough approach must ensure proper education. Good knowledge of coronavirus infection is associated with positive attitudes and effective practices; therefore, concise knowledge of a disease affects individuals' preventive practices and attitudes (Kok et al., 2008). Thus, a Knowledge, Attitude, and Practice study are essential for understanding the level of awareness towards COVID-19 as it provides baseline information to determine the type of intervention that may be required to change misconceptions about the virus (Zhong et al., 2020). In an unprecedented way, COVID-19 has affected all stakeholders in education, especially university students who represent a special group of people characterized by more autonomy and a pressing need to live independently but with limited experiences. University students are in the physical and mental development stage of significant changes. It is also the time in which their perspective on life and the world gradually takes shape. Their understanding of society and self-knowledge is not adequately developed at this point, and they are inexperienced at adjusting to society's pressure (Zhao et al., 2020). Therefore, their perceptions and behaviors would inevitably be influenced in the face of a major crisis such as a pandemic. This study was first conducted locally and targeted students, the next generation of professionals and agents of change within their families and communities to ensure readiness and social adaptation in the event of a pandemic (Mohr, K. & Mohr, E., 2017). Such a crisis offers students the opportunity to learn, nurture compassion, and build resilience while building a safer and more caring community. This study aims to assess the knowledge, the attitude of concern, and prevention practices of university students towards COVID-19. This investigation's results are expected to assist in better planning for awareness campaigns among higher educational institutions and directing the various health authorities to modulate their policies accordingly to prevent the spread of the virus, leading to rapid control containment of the ongoing pandemic.

Methodology

Research Design

The study utilized a cross-sectional descriptive research design to assess coronavirus infection-related knowledge, attitude, and practices among university students.

Sample and Setting

Purposive sampling was the technique utilized in the selection process of the participants. Participants of this study were college-level students from Holy Angel University as it is the largest private educational institution with the largest student population in Central Luzon. The open-access web-based epidemiologic statistics package (OpenEpi.com, version 3.01) yielded a total of three hundred fifty-seven (357) university students after factoring in the estimated population size of five thousand (5,000), hypothesizing a 50% chance of the outcome variables being noted at 95% confidence interval (Dean et al., 2013).

Study participants were full-time university students, 18 years of age or older at the time of the survey, both male and female students who participated voluntarily.

Research Instrument

A self-administered questionnaire adapted from Al-Hazmi et al. (2016) was utilized for the study. It assessed university students' knowledge regarding the clinical manifestation and mode of transmission, the attitude of concern, and preventive practices towards COVID-19. The questionnaire was designed by a focus group comprised of an epidemiologist, infectious disease experts, and family physicians. The questionnaire's reliability in its English translated form was measured by calculating the internal consistency for each of the subscales and the total scale. Cronbach's coefficient alpha of the total scale is >0.8, which is generally regarded as satisfactory (Al-Hazmi et al., 2016). Permission from the author via email was requested for the utilization of the tool.

The study questionnaire featured multiple-choice questions, and it is divided into 4 parts. The first part comprises the participant's attitude of concern towards the disease, risk perception regarding the virus. To measure the attitude among the participants, they were asked a question whether they perceive the coronavirus infection (COVID-19) as "Very dangerous," "Moderately dangerous," or "Not dangerous." The second and third parts have identified the participants' knowledge about the disease's signs and symptoms and its mode of transmission, respectively. To measure knowledge about the viral infection, 10 items were included. These items include knowledge regarding the clinical manifestations and transmission routes. The last part determined the practices towards protection against coronavirus transmission. To measure practices, participants were asked whether they use face masks; do handwashing; use tissues during coughing and sneezing; avoid close contact with infected individuals, and avoid touching their nose, mouth, and eyes to reduce the risk of infection.

Data Collection Procedure

Several strategies were utilized to reach as many participants as possible. This includes social networks such as reaching out to university student council officers and social media posts thru various media channels to share the survey questionnaire. A study's protocol was attached to the survey tool containing a letter of invitation and electronic informed consent. The data was collected via an online survey questionnaire using "Google Forms." The google form link was posted and sent to participants using electronic means of communication (thru email and other web-based platforms). Questionnaire responses were downloaded from Google Forms and exported to Microsoft Excel for coding and further analysis. The data is to be stored for two years from the date of termination of involvement or at such time. The participant submits electronic cancellation of his consent as per the Data Privacy Act of 2012.

Data Analysis

Using descriptive statistics functions in Microsoft Excel, the data were tabulated and analyzed. The statistical data were analyzed in the form of mean and standard deviation for the participants' age and expressed as frequency and percentages for the participants' socio-demographics, coronavirus infection-related knowledge, attitude, and practices for descriptive purposes.

Ethical Approval

The study was ethically approved and reviewed by the Institutional Review Board (IRB) committee of Holy Angel University with the protocol number: 2020-031-CMSARTE-KPACOVID19. The participation of university students was completely consensual, anonymous, and voluntary. Each questionnaire was accompanied by a cover letter explaining the study's purpose, informing the participants that their participation was optional, and they are entitled to withdraw from the study at any stage. A consent form was also attached to the study's protocol to complete the survey forms and how the participants' identification and responses will be kept confidential. No identifying information was required for demographic profiling and analysis of participants.

Result

Table 1. Demographic profiles of university students

Demographic Variables	f	%
Age		
18-20	274	76.8
21-23	63	17.6
24-26	14	3.9
27-29	1	0.3
30-32	3	0.8
33-35	2	0.6
Gender		
Male	148	41.5
Female	209	58.5
Department		
School of Business and Accountancy	79	22.1
School of Engineering and Architecture	59	16.5
School of Arts and Sciences	28	7.8
School of Education	31	8.7
School of Hospitality and Tourism Management	25	7.0
School of Nursing and Allied Medical Sciences	73	20.5
School of Computing	31	8.7
College of Criminal Justice Education and Forensics	31	8.7

Demographic Variables	f	%
Year Level		
First-year	48	13.4
Second-year	206	57.7
Third-year	91	25.5
Fourth-year	10	2.8
Fifth-year	2	0.6

Note: **n** = 357 **f** = frequency **%** = percentage

Demographic characteristics

This study involved 357 university students recruited from the different departments of Holy Angel University. As for the age distribution, their mean age is 20.23 (SD:2.19) and ranges from 18 to 35 years old. Among them, more than half of the participants (58.5%) were females. As for the department, 22.1% were from the School of Business and Accountancy, 20.5% were from the School of Nursing and Allied Medical Sciences, 16.5% were from the School of Engineering and Architecture, and 40.6% were from other departments of the university. The majority of the students belong to the 2nd year (57.5%) level in the university.

Table 2. The attitude of concern of University students towards coronavirus infection

Attitude Variables	Males	Females	**Total** f (%)
Very dangerous	70	127	197 (55.2)
Moderately dangerous	68	79	147 (41.2)
Not dangerous	10	3	13 (3.6)
TOTAL	148	209	357 (100)

Note: **n** = 357 **f** = frequency **%** = percentage

Attitude of concern

Regarding students' attitude of concern of university students towards coronavirus infection. Based on the data, an attitude of concern about the viral infection can be observed (55.2%), whereas only a few reported having no concern (3.6%). More females than males regard coronavirus as very dangerous among genders.

Table 3. Knowledge about the clinical presentation of coronavirus infection

Knowledge (signs and symptoms) Variables	*Yes*		*Total*	*No*		*Total*
	Males (36.97%)	**Females (54.45%)**	**f (%) (91.42%)**	**Males (4.49%)**	**Females (4.09%)**	**f (%) (8.58%)**
Fever	145	206	351 (98.3)	3	3	6 (1.7)
Cough	145	206	351 (98.3)	3	3	6 (1.7)

Knowledge (signs and symptoms) Variables	*Yes*		*Total*	*No*		*Total*
	Males (36.97%)	Females (54.45%)	f (%) (91.42%)	Males (4.49%)	Females (4.09%)	f (%) (8.58%)
Shortness of Breath	144	208	352 (98.6)	4	1	5 (1.4)
Nasal and Throat Congestion	139	202	341 (95.5)	9	7	16 (4.5)
Diarrhea	87	150	237 (66.4)	61	59	120 (33.6)

Note: **n** = 357 **f** = frequency **%** = percentage

Table 4. Knowledge about the mode of transmission of coronavirus infection

Knowledge (mode of transmission) Variables	I agree		I don't agree		I don't know		Total
	f	%	f	%	f	%	f (%)
Coughing and sneezing	357	100	0	0	0	0	357 (100)
Handshaking	344	96.4	8	2.2	5	1.4	357 (100)
Touching of surfaces such as doorknobs and tables	346	96.9	6	1.7	5	1.4	357 (100)
Exposure to crowded places	355	99.4	2	0.6	0	0	357 (100)
Animals to humans	167	46.8	121	33.9	69	19.3	357 (100)

Note: **n** = 357 **f** = frequency **%** = percentage

Knowledge of clinical presentation and mode of transmission

Among the university students in the different departments, there is an overall agreement regarding the responses. The majority of the students have a good knowledge regarding the signs and symptoms and have reported shortness of breath (98.6%), fever (98.3%), and cough (98.3%) as common factors in the clinical presentation of the viral infection. However, it also showed that several university students recognized that diarrhea (33.6%) is not a clinical manifestation of coronavirus. Moreover, female university students illustrated a slightly better understanding (54.45%) of coronavirus infection's clinical presentation compared with male university students.

Among the ways the virus can be transmitted, all university students agree that the most common transmission source is exposure to coughing and sneezing via droplets. The majority (99.4%) also agree that exposure to crowded places can increase infection risk. A proportion of students who think that handshaking (96.4%) is slightly lower than those who think that touching surfaces may increase infection spread. Furthermore, less than half of the participants (46.8%) knew that coronavirus infection could be transmitted through animals to humans and associated with infection risk.

Table 5. Practices to prevent coronavirus infection

Practices Variables	I agree		I disagree		I don't know		Total
	f	%	f	%	f	%	f (%)
Using face mask	357	100	0	0	0	0	357 (100)

Practices Variables	I agree		I disagree		I don't know		Total
	f	%	f	%	f	%	f (%)
Handwashing	327	91.6	4	1.1	26	7.3	357 (100)
Using tissues during coughing and sneezing	327	91.6	11	3.1	19	5.3	357 (100)
Avoiding close contact (1 meter or 3 feet) with an infected person	349	97.8	7	1.9	1	0.3	357 (100)
Avoid touching of nose, mouth, and eyes	319	89.3	11	3.1	27	7.6	357 (100)

Note: **n** = 357 **f** = frequency **%** = percentage

Prevention Practices

The results show that 100% of university students have reported that the most frequently used practices of protection against virus transmission are face masks and avoiding close contact with infected persons (97.8%). Besides, handwashing and the use of tissues during coughing and sneezing have often been reported by students as preventive measures. Among the following protection practices, university students' least suggested method is avoiding the touch of nose, mouth, and eyes towards infection prevention.

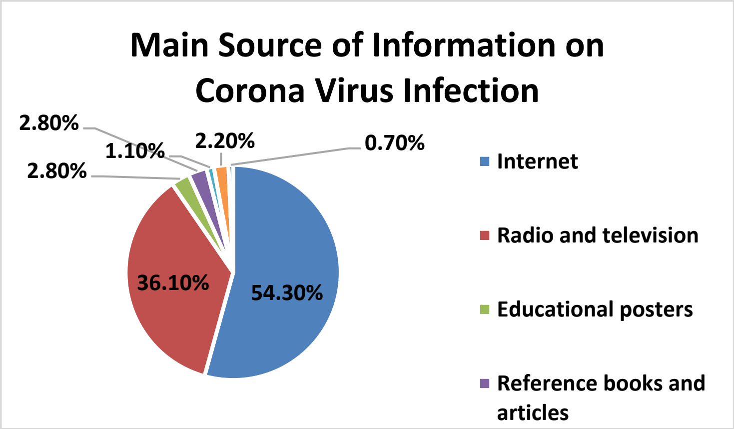

Figure 1. Source of information about coronavirus infection among university students *(n = 357).*

The main source of information

The analysis shows that 54.3% of university students use the internet as their main source of information regarding coronavirus infection. About 36.1% collected information from radio and television. Among sources of information, newspapers, and magazines, 1.1% appear to be a less favored option for gathering knowledge towards the viral infection.

Discussion

The study shows that majority of the students were adequately attentive to the essential details of the viral infection. University students from Holy Angel University have good knowledge about the clinical manifestations (91.42%) and mode of transmission of COVID-19. For many decades, several generations of students have advanced from higher education institutions. Generation Z's new generation comprises individuals born between 1995–2009 (Strauss & Howe, 2020; McCrindle & Wolfinger, 2011) are the dominant generation of students currently entering the university (Mohr, K. & Mohr, E., 2017). Gen Z has unique characteristics and expectations, and like the millennials, they were raised with technology. However, technology is part of their everyday lives (Schwieger & Ladwig, 2018). Thus, the reasonably high level of knowledge amongst university students was likely due to their exposure to social media (54.3%) as their main source of information regarding COVID-19. They were aware that the most common symptoms of COVID-19 are fever, fatigue, and dry cough, with patients experiencing difficulty breathing and other symptoms including headache, sore throat, and diarrhea (Chen et al., 2020; Wang et al., 2020). The most frequently reported source by university students is coughing and sneezing via droplet for what concerns transmission mode. This finding comes from a study on survey data among Indonesian undergraduate students wherein most of the students were knowledgeable about COVID-19, and their overall attitude was favorable (Saefi et al., 2020). Similarly, a Nigerian study reported that 88% of university students had correct knowledge about symptoms, spread factors, self-isolation, and medical cures of COVID-19 (Rakhmanov & Dane, 2020).

The most frequently reported source of information regarding COVID-19 is the internet (54.3%) and the media (36.1%). Gen Z often referred to as true digital natives: from their earliest youth, have been exposed to the internet, social networks, and the mobile system is characterized as 'information curators' who use social media to perceive the world (Seemiller & Megan, 2016). In this study, the findings among university students regarding knowledge on COVID-19 reflect a good relationship between their understanding and the information available in the media about COVID-19. For example, most students recognized that fever, cough, and shortness of breath are the common clinical manifestation of COVID-19. However, most of the students identified animal to human transmission as associated with a higher risk of infection. It is comparable with the Department of Health (2020) report that animals are probably the source of COVID-19 and may have originated from animals before it has infected humans.

However, a handful of students seems to disagree and is unclear if it is related to increased infection risk. This is unsurprising given that no official statement confirms animals as a source for the virus. This finding is consistent with the fact that the exact source of the COVID-19 is uncertain, it has been primarily hypothesized to have come from an animal but according to CDC (2020b), there is no evidence that these animals can transmit the disease and spread COVID-19 to humans. Therefore, more studies are needed to understand whether and how COVID-19 could affect different animals.

The study also resulted in an overall good practice of preventive measures among university students toward the disease. Most university students follow practices of COVID-19 towards prevention, such as the use of facemask, hand washing, and avoiding close contact with infected individuals. These measures are well known for the prevention of many infectious diseases, particularly respiratory transmitted viral infections. However, all the participants support the attitude of wearing a mask and its practice as a preventive measure against the infection. This contradicts the advice shared by the WHO (2020) that there is insufficient evidence for or against the use of face masks in healthy individuals in the wider community, and it should be combined with other key measures to prevent infection, such as hand washing, proper cough etiquette, and social distancing. The behavior and practice of wearing face masks may reflect the vast amount of information circulated and regarded by the community, which needs further awareness campaigns to minimize the panic among the wider community.

Since the outbreak of COVID-19, there have been worldwide enacted school closures that range from one month to the rest of the academic year, and approximately billions of learners (1.716 billion) have been affected. It has created a negative effect on the educational institution's stakeholders and an impact on socio-economic consequences (UNESCO, 2020; Lindzon, 2020). The fight against the coronavirus continues worldwide. Thus, university students' knowledge, practices, and attitude regarding viral infections are critical information in response to its outbreak (Ajilore et al., 2017; Tachfouti et al., 2012). In 2010, a study examined the level of understanding of domestic and international university students towards seasonal and pandemic influenza wherein it stated that it is necessary to emphasize that pandemic influenza could pose a real threat, students should be informed about disease transmission and risk of infection to determine as to which strategies are to be effective and strictly comply to the preventive health measures (Seale et al., 2012). During the H1N1 influenza pandemic in 2009, it recorded over 95,500 cases at 170 American college institutions. Researchers have found out that college students showed a lack of knowledge regarding the disease, thus ignoring the H1N1 vaccine and flu-prevention behaviors (Koskan et al., 2012). Insufficient knowledge of the disease's characteristics facilitates preventable transmission of disease, inaction with health behavior, and fear from the disease (Kok et al., 2008).

As the educational system enter this unfamiliar crisis management phase, the government must make good efforts to provide the community with sufficient knowledge regarding COVID-19, especially on specific control measures such as wearing face masks integrated with other viral infection-prevention initiatives. The government's role in disseminating valuable information about the current pandemic can have a significant impact on the wider community, particularly among schools and universities (Hornik, 2002; Wakefield et al., 2010; Majumder et al., 2015).

Nurses play a critical role in providing health education and counseling, as the main objective of health programs focuses on prevention and early intervention in the face of a major health crisis. During this pandemic, nurses are the primary educators, resources for information, and the front-liners towards providing care during periods of crisis (Buchan et al., 2019; Cohen et al., 2012). As front-line healthcare professionals, nurses are key stakeholders in developing and implementing policies regarding care standards during the pandemic. They are well-positioned to lead the health system by partnering with physicians, health organizations, and the government to provide comprehensive educational campaigns for families and students to bridge the gap between the current and required knowledge.

Limitations

In interpreting the results of this study, limitations of the study were also considered. A limitation of this study is the instrument utilized for the collection of data. The instrument was adopted from a survey that had been validated and used previously in Saudi Arabia (Al-Hazmi et al., 2016). A limited number of questions measured the level of knowledge, attitude, and practice. Thus, to identify KAP's actual extent, additional assessments will be necessary, using all aspects of KAP towards COVID-19.

Another limitation of this study is the probability of socially acceptable responses provided by participants. Since this study used self-reported data, participants may have responded positively to knowledge, practices, and attitude questions based on what they consider to be expected (Mortel & Thea, 2008).

Conclusion

This study is the first to attempt to assess the perceptions of university students about coronavirus infection locally. In conclusion, the present study has demonstrated good knowledge and practices towards COVID-19 and presented the level of risk perception among 357 university students at Holy Angel University. The findings show a good level of perception about the risk of the disease. An attitude of concern about COVID-19 is shown by factors such as reporting fever, cough, and shortness of breath as clinical signs and symptoms manifest from the virus. The indication of fever, cough, and shortness of breath as a clinical presentation could be related to the students' orientation towards the most common clinical manifestation of COVID-19. Most university students sought their knowledge from social media settings and traditional media. This perception could be an important finding on the students' awareness regarding the severity of the disease.

Awareness of the disease is regarded as the first step in any health education program carried out. Knowing the causes and sources of a disease's transmission increase the likelihood that individuals may become more aware of the spread of communicable diseases and the preventive measures to slow its transmission. The study suggests establishing professional health education campaigns to enhance further awareness of university students, which would positively influence their perception towards coronavirus infection, and to inform students about measures such as avoidance in touching nose, mouth, and eyes can prevent the spread of infection and proper cough etiquette by using tissues. Higher education institutions may develop a policy or project implementation for such an outbreak to be prepared for the current crisis, COVID-19, and the infectious diseases that might emerge in the future. Moreover, among other health care professionals, nurses should be more involved in the process of education about infectious diseases.

Finally, as this study was first conducted locally and with only university students as participants in this survey, there is a need to conduct correlational studies involving teaching and non-teaching personnel in the state and universities of the state and country occurrence of the pandemic.

Conflict of Interest

The author has no conflict of interest to disclose.

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REVIEW ARTICLE

Healthcare Workers Attitude and Stigma among People living with HIV/AIDS (PLHA): A Literature Review

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Abstract

Background: The concept of stigma and discrimination discussed in literature illuminate patient's experiences in the hands of health care providers. The review aims to assess the existing literature published in internet databases focusing on the personal perception of stigma and discrimination of health care workers as well as the patient's perception of their attitudes that may be stigmatizing and discriminatory.

Methodology: A web-based search was done in the three (3) databases including EBSCOhost, Google Scholar, and PubMed. The search utilized five keywords: 'Stigma'; 'Discrimination', 'Perception', HIV/AIDS,' and 'Nurses.' Inclusion criteria includes full-text, peer-reviewed, academic journal in the English language, and published between the years 2013-2018. The studies were screened according to their relevance to the objectives of the study. The quantitative and qualitative checklist of the Standard Quality Assessment Criteria for Evaluating Primary Research Papers and Joanna Briggs Institute data extraction protocols were utilized by two interrater in the analysis of the literature. The extracted data were synthesized using a table highlighting the key findings of the studies.

Results: A total of fourteen (14) titles were included in the review after evaluating its relevance to the objective and appraising its high quality. Content analysis was done and resulted in the formulation of four themes which include: (1) General Characteristics of the Literature (2) HIV/AIDS Stigma and Discrimination as perceived by health care providers; (3) Perception of health providers' attitude among HIV infected persons; and, (4) the consequences of HIV/AIDS stigma.

Conclusion: The issue of HIV/AIDS stigma and discrimination is a significant component that affects patient - care provider interaction. Health care providers understand the role they play in improving the lives of their PLHA patients. Likewise, patients perceive that stigma is existent and tangible in health care facilities. HIV/AIDS stigma is a barrier between the patient and the health care team and can lead to the detriment of the patient's health outcomes and satisfaction.

Keywords: *stigma, discrimination, attitude, health care providers, HIV*

Introduction

The effect of HIV/AIDS is non-selective to the type or class of people in society. However, its devastation is exponential, especially to low sourced countries and marginalized. Based on the UNAIDS report (2017a) there are approximate, 36.7 Million people are living with HIV where 34.5M of which are adults, and 17.8 M are composed of women aging 15 years and above in the year 2016. Additionally, the report suggests that there are a total of 1.8 Million newly HIV infected persons where 1.7Million of which are adults aging at least 15 years old.

Statistically, the majority of HIV infections are from low prevalence settings which are considered as key populations – people who inject drugs, transgender, prisoners, gay men, and men who have sex with men (MSM). It appears that gay men and other MSM accounted for 12% of new infections in 2015, followed by sex workers (5%), and drug users (8%) (UNAIDS, 2017a). Over the last decade, tangible signs of progress were reflected in global statistics on HIV/AIDS. The global trend shows a dramatic 48% decline in AIDS-related between 2005 and 2016 (UNAIDS, 2017a). This was achieved because of the higher treatment coverage and the client's better adherence to antiretroviral therapy. With early detection and referral for early treatment and management, HIV can be managed as a chronic disease with good chances of living longer comfortable lives (Nakagawa et al., 2012).

While there have been notable improvements in the epidemiological aspect of HIV, issues on stigma, and discrimination (S&D) remained. Various literature has suggested the detrimental consequence of S&D to the overall improvement of the quality of life among persons living with HIV/AIDS (PLHA). Discouragement to disclose and seek medical attention, fear of getting tested for infection, refusal to get counseling and care services, and poor health outcomes are a few of the negative impacts of stigma to a person who may have issues on having HIV (Turan et al., 2017; UNAIDS, 2017b). The repercussion of this lack of education is the uncontrolled multiplication of infected individuals who may predispose the entire population to the risks of acquiring HIV.

The concept of stigma and discrimination discussed in the literature illuminates patients' experiences in the hands of health care workers. The social and cultural environments where people interact and associate are precursors to the conceptualization of stigma and discrimination, making it an insidious and persistent issue to date. This suggests that how one person perceives the concept of HIV/AIDS, maybe conveyed either positively or negatively to another. The exchange of interaction may create possible prejudices between and among individuals compromising the fundamental role of health workers as patient advocates.

Aims of the Study

This study aimed to review the existing literature published in internet databases focusing on the concept of perception and attitudes towards HIV/AIDS between the care provides and care recipients. Specifically, this review intends to identify the health care providers' perception of stigma on HIV/AIDS as well as PLHA patient's perception of the health care providers' attitudes that may be stigmatizing and discriminatory.

Methodology

Eligibility Criteria

The following are the inclusion and exclusion criteria applied to screen for applicable articles:

Inclusion criteria:
(1) in full-text
(2) Peer-reviewed
(3) Published between the year 2013-2018
(4) Academic journal
(5) in the English language
(6) within major heading: 'attitude of health personnel'

Exclusion criteria:
(1) not full-text
(2) not peer-reviewed
(3) published earlier than 2013
(4) non-academic literature
(5) not in English

Information Sources and Search strategy

A literature review is appropriate for the diverse range of literature published on the concept of stigma and discrimination among health care personnel caring for PLHA. The review consisted of a comprehensive search in the three (3) research databases including EBSCOhost, Google Scholar, and PubMed. The search utilized five keywords: 'Stigma'; 'Discrimination', 'Perception', 'HIV/AIDS,' and 'Nurses.' We used these keywords and the Boolean term "AND" in search of relevant studies. The review was done on July 15, 2018.

Selection Process

The initial search resulted in 14,400 hits. Two reviewers screened the retrieved reports for their appropriateness in this review. Deliberation was done on which literature is to be retained or excluded. The decision to retain was made only if both reviewers agree to such. The researchers limited the search within the last 5 years (2013-2018) to ensure that he included articles are timely and relevant in the current time. Using the inclusion and exclusion criteria, we were able to get relevant studies by reading through the abstracts. The search further reduced to twenty-three after instituting the other inclusion and exclusion criteria. Relevant studies were saved in a folder that was later read and analyzed. Excluded literature were those not peer-reviewed, reports, irrelevant to the objective of the research, and inaccessible. The authors contacted the authors of these inaccessible papers but later decided to exclude the same due to lack of follow-through. Finally, there were fourteen retained articles included in this review. The process followed for this review is shown in Figure 1.

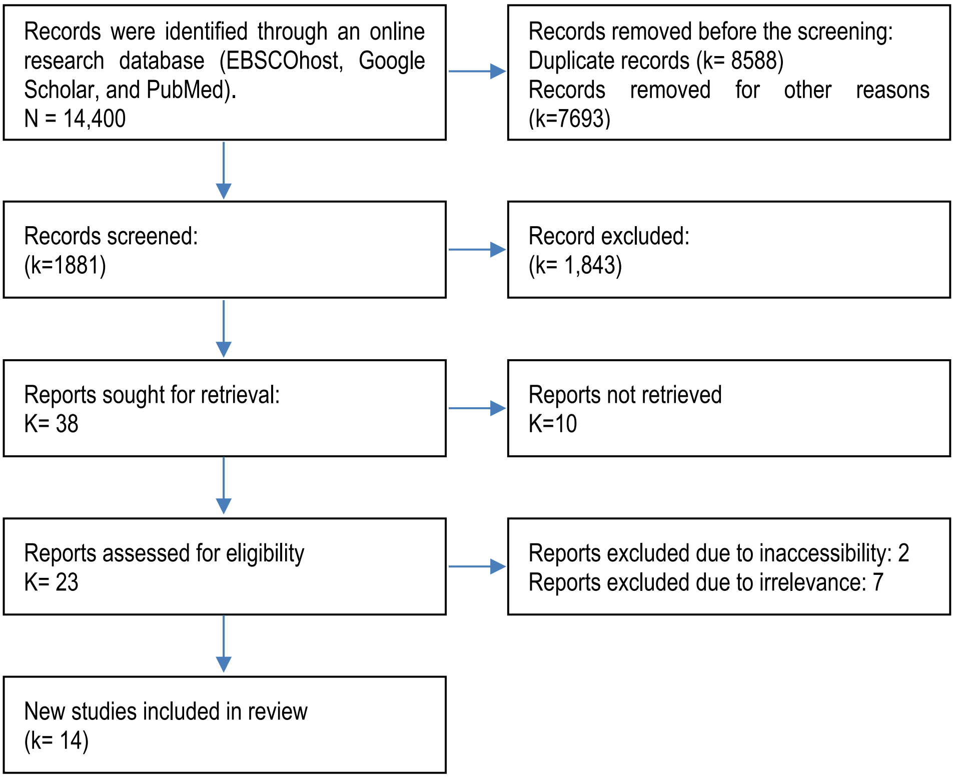

Figure 1. Literature Review Flowchart

Data Collection Process

The researcher utilized a quantitative and qualitative checklist of the Standard Quality Assessment Criteria for Evaluating Primary Research Papers (Kmet et al., 2004) to assess the quality of the article retrieved. The checklist was helpful in our evaluation of the quality of the relevant studies that were retained in our search. The studies were appraised by at least two inter-rater agreement based on the purpose of the study, appropriateness of the research design, methodological rigors, and sufficient reporting. There were fourteen quantitative and ten qualitative criteria to consider for each article. After evaluating the reports and ensuring their high quality (80%-100% scores), data extraction was done following the Joanna Briggs Institute data extraction protocols (Munn et al., 2014).

Synthesis Method

After screening the retained articles, we found that the studies are incomparable because of their differences, such as the methods, analysis, measurements, presentation of results used, among others. Due to this limitation, the researchers used content analysis centered on the key findings by reading through the text and extracting relevant information pertinent to this review. The data was organized and synthesized using a tabular form noting the names of authors, year of publication, the purpose of the study, research design, participants of the study, and the stigma related key findings (Table 1). Reading and re-reading process was done on the extracted data which resulted in the formation of the four themes namely: (1) general characteristics of literature; (2) the HIV/AIDS stigma and discrimination as perceived by health care providers; (3) Perception of health providers' attitude among HIV infected persons, and, (4) The consequences of HIV/AIDS Stigma. A summary of the key findings is presented in Table 2.

Table 1. Summary of Literature

No.	Authors and Year	Purpose of the Study	Research Design	Participants	Stigma related Key Findings	Quality Appraisal Score
1	Valencia-Garcia, D., et al. (2017)	To examine HIV stigma related issues among women.	Qualitative	PLHA women of legal age	The most distressing and frequent experience of stigma are derived from health care providers	85%
2	Wanger, A. et al. (2016)	To examine the health care providers attitude and beliefs towards people with HIV	Qualitative	Medical and Nursing students; health care providers, PLHA	Medical and educational establishments perpetuate discrimination as an enacted stigma on sexuality and prejudice against PLHA	90%
3	Sison, N. et al. (2013)	To assess local providers attitudes and	Qualitative	Health care providers	Opportunities for enhancing routine HIV testing,	100%

No.	Authors and Year	Purpose of the Study	Research Design	Participants	Stigma related Key Findings	Quality Appraisal Score
					treatment, and care are doable; Stigma acts as a barrier to linkage to treatment and cares among PLHA	
4	Mmeje, O. et al. (2016)	To develop a Safer Conception Counselling Toolkit as a training tool for health care practitioners	Qualitative	Health care providers; PLHA couples	HIV affected individuals desire to receive safer conception. Health care practitioners are skeptical about PLHA couples raising a family	100%
5	Bofill, L.M. et al. (2014)	To explore and identify factors associated with engagement and retention in public and private health care in Argentina	Qualitative	Health care providers and PLHA	Patients and health care providers agree that stigma is a major barrier to adherence to care and treatment. Patients acceptance of HIV status enhances family and community support and adherence to treatment	85%
6	Coll, A.S. et al. (2015)	To explore the knowledge, attitude, and practices of health care providers regarding preconception counseling, safer conception, and pregnancy among HIV infected women	Qualitative	Health care providers	The majority of Health care providers feel that patient's pregnancies are unplanned and accidental. Patient-centered are infrequently prioritized in the agenda during consultations.	85%
7	Servin, A.E. et al. (2014)	To describe and compare experiences and perceptions of Mexican and US HIV care	Qualitative	Health care providers	There is a disparity in the access to antiretroviral therapy between the two groups.	95%

No.	Authors and Year	Purpose of the Study	Research Design	Participants	Stigma related Key Findings	Quality Appraisal Score
		providers regarding barriers to HIV care access for Latino patients living in the US-Mexico border region			Participants feel that HIV-related stigma is contributory to the lack of knowledge on HIV in the workplace, family, and even among health care providers. HIV related stigma impacts the patients feeling when presenting in a care facility	
8	Scorgie, F. et al (2013)	To understand the barriers in accessing care among sex workers	Qualitative	Transgender sex workers	Participants express denial of treatment in health facilities, criminalization and stigmatization hinder their access to HIV care.	85%
9	Leidel, S. et al. (2015)	To explore experience, attitude, barriers, facilitators of opt-out HIV testing from the health care personnel perspective	A qualitative - systematic review	-	The common attitude of health care providers was the outdated notion that HIV is a terrible disease that equates to a death sentence.	80%
10	Stutterheim, S.E. et al (2014)	To explore the interactions of the health care professional and the PLHA	Mixed-method	PLHA and health care professionals	There is a moderate to high care avoidance among health care providers towards PLHA. PLHA experienced both negative and positive caring experience from their care providers. Care providers expressed the	96%

No.	Authors and Year	Purpose of the Study	Research Design	Participants	Stigma related Key Findings	Quality Appraisal Score
					need to fo more training and knowledge in caring for patients with HIV.	
11	Li, L. et al. (2013)	To reduce service provider's attitude and behaviors toward people living with HIV	Quantitative	Health care practitioners	Whitecoat and warm heart (WW) reduces prejudicial attitudes and level of avoidance of the health care professionals in providing care to PLHA	92%
12	Rogers, S.J. et al (2013)	To assess layered stigma among healthcare professionals providing services to PLHA	Quantitative	Health care providers social service agencies	Most staff are not knowledgeable and trained in HIV care, treatment, and psychosocial support. Most of the participants believe that the PLHA and sex workers are to blame for the negative judgment towards them. Stigmatizing attitude is higher among staff in general facilities. Most of these negative attitudes came from participants who did not receive any training related to HIV care.	82%
13	Zarei, N. et al. (2015)	To assess the stigmatized attitude among health care providers toward PLHA	Quantitative	Health care providers	All personnel had a moderately stigmatized attitude. The most dominant attitude was dealing with the fear of transmission. Personnel prefers not to provide	82%

No.	Authors and Year	Purpose of the Study	Research Design	Participants	Stigma related Key Findings	Quality Appraisal Score
					service to sex workers and gays for the reason of their unethical behavior. Their increasing stigmatized attitude is associated with the increased unwillingness to provide service to patients.	
14	Mangus, M. et al. (2013)	To evaluate patient perceptions of provider attitudes among HIV infected persons	Quantitative	HIV patients	Persons reporting a break from care were more likely to report negative experiences with doctors or nurses not always listening carefully to them, not explaining things for them. Likewise, they reported higher component scores for internalized stigma scale, including society looks on HIV persons, feeling like an outsider, feeling that provider was uncomfortable because the participant is an HIV positive, and preference to avoid or refuse to serve the participant. Women were more likely to have an elevated stigma score, as were participants over 30, while those with a gay or bisexual orientation were less likely to have an elevated stigma score.	82%

Results

General Characteristics of the literature

Meticulous selection and evaluation of articles were made on the remaining literature after screening. There were a total of eight (8) qualitative; four (4) quantitative; and one (1) mixed-method, and one (1) systematic review for a total of 14 relevant research articles included in this review. No literature was found to examine HIV/AIDS stigma and discrimination exclusively among nurses. All studies involved a variety of participants across all members of the health care team. It included doctors, nurses, laboratory technicians, health aides, and the like. All literature included in this review observed ethical standards. All studies discussed how ethical clearance was secured before the conduct of their research. One Study utilized a mixed-method approach combining cross-sectional and thematic analysis. Among the qualitative literature gathered, samples range between 5-25 participants gathered purposively. The method of data gathering employed were in-depth interviews among key informants and focused group discussions. Thematic analysis and grounded theory analysis were the most commonly used method.

On the other hand, the quantitative literature was mostly cross-sectional studies except for one experimental design. Study samples range from 88 to more than 1700 respondents of whom were selected using systematic sampling techniques. Data gathering employed the use of questionnaires and the conduct of face-to-face interviews.

Table 2. Key findings in the literature

Key Findings		Citing Literature
Sources of HIV Stigma	• Lack of knowledge	Servin et al., 2014; Valencia-Garcia et al., 2017; Wagner et al., 2016 Zarei et al., 2015
	• Discordant relationship with partner, family, friends, workmates	Servin et al., 2014; Valencia-Garcia et al., 2017
	• members of the community and healthcare providers	Valencia-Garcia et al., 2017; Wagner, 2016
Vulnerable groups	• MSM	Rogers et al., 2014
	• Sex workers	Rogers et al., 2014; Valencia-Garcia et al., 2017 Scorgie et al., 2013
	• HIV couples	Coll et al., 2015; Mmeje et al., 2016
Perceptions of health care providers towards HIV/AIDS stigma	• Believes that fear towards HIV/AIDS and patients diagnosed with it nonexistent and obsolete	Stutterheim et al., 2014; Leidel et al., 2015

Key Findings		Citing Literature
	• Understands the patient's difficult situation	Servin et al., 2014; Leidel et al., 2015
	• Believes patients with mental and physical issues experience more stigma	Servin et al., 2014
	• Patients should be informed of their HIV status to increase treatment engagement.	Bofill et al., 2014
	• Health workers who have no previous experience in caring for HIV/AIDS patients have more stigma	Zarei et al., 2015
	• Understands that honing knowledge and competencies are required before care for these patients	Stutterheim et al., 2014; Rogers et al., 2014; Mangus et al., 2013
	• The building of family among HIV couples is an issue requiring attention.	Coll et al., 2015; Mmeje et al., 2016; Valencia-Garcia et al., 2017;
	• Believes in joint effort coming from health workers and patients	Mmeje et al., 2016; Coll et al., 2015)
Perceptions of PLHA patients towards their care providers	• Experienced hostility denial of treatment, blaming shaming, higher user fees, discrimination towards family members	Scorgie et al., 2013
	• Feels double stigma: being judged because of their line of work + HIV; Being judged because of their physical health condition + HIV	Valencia-Garcia et al., 2017
	• Feels that stigma from healthcare workers is the most distressing form of stigma	Valencia-Garcia et al., 2017; Scorgie et al., 2013; Wagner et al., 2016
	• Fears breach to rights of confidentiality such as chart-flagging, physical isolation	Valencia-Garcia et al.,2017; Stutterheim et al.,201
Consequences of HIV/AIDS Stigma	• Reduced patient satisfaction	Li et al.,2013
	• Loses interest in self-care, delays in treatment, and poor health outcomes among PLHA	Servin et al., 2014
	• Acts as a barrier to seek for treatment among PLHA	Sison et al., 2013; Bofill et al., 2014

HIV/AIDS Stigma and Discrimination as perceived by health care providers

Stigma among people living with HIV/AIDS may result from different sources which include lack of knowledge, discordant personal relationships with their partners or family, friends, judgmental workplace and members of the community, and even among care providers (Servin et al., 2014; Valencia-Garcia et al., 2017; Wagner et al., 2016). Among vulnerable groups, it appears that most stigmatized are the men having sex with men (MSM) and sex workers (SW) (Rogers et al., 2014; Scorgie et al., 2013). Furthermore, there is an association between religious belief and stigmatized attitude, society stigmatized attitude, and knowledge of transmission mode (Zarei et al., 2015).

Most care workers feel that caring for patients with HIV has become comparatively normalized and is no longer a big issue and considers the stigma attached to this as obsolete and nonexistent (Stutterheim et al., 2014; Leidel et al., 2015). Literature suggests that health providers understand the gravity of stigma that their patients feel as HIV carriers especially when they present for care in clinics fearing shame and discrimination when disclosing their seropositive status (Servin et al., 2014; Leidel et al., 2015).

One study found how PLHA shared positive experiences with health workers. About 76% of predominantly gay men PLHA in a Dutch health care setting received equal treatment, extra attention, respect, social support provision, and assurances of confidentiality as compared to negative experiences in their interaction with their care workers (Stutterheim et al., 2014). On the other hand, health providers perceive that the burden of HIV-related stigma can be higher than mental illness or other physical health conditions (Servin et al., 2014). However, the success of helping HIV affected client is a two-way process and does not solely rely on the health provider alone. The health workers believe that patients should be made aware of their HIV status to gain a better understanding of the illness process and make them more engaged in treatment and adhere to medication regimens (Bofill et al., 2014).

Health care providers believe that their patients do not understand that they too are at risk for contracting the disease. The most dominant attitude among health care providers toward patients with HIV/AIDS is dealing with fear which is typically found among those who have no experience with these patients (Zarei et al., 2015). Several authors have suggested that care providers feel the need to improve on their competencies as health workers caring for HIV/AIDS patients. Specific areas needing focus are on HIV prevention, HIV care and treatment, psychosocial support, and approaches to working with vulnerable groups MSM and sex workers (Rogers et al., 2014; Valencia-Garcia et al., 2017; Scorgie et al., 2013). Healthcare workers acknowledge the need for more knowledge and experience in caring for patients with HIV/AIDS such as those of MSM and SW and agree for more training to provide the optimum care their patients deserve (Stutterheim et al., 2014; Rogers et al., 2014). The white coat, warm heart (WW) intervention by Li et al. (2013) was able to improve the attitudes and behaviors of health care workers after being implemented in their work environment. Less prejudicial attitudes and avoidance toward PLHA were achieved during evaluation 12 months after. This approach primarily focused on how to support health workers earns occupational safety apart from providing only essential information in providing care for HIV/AIDS clients.

Childbearing among HIV-affected couples is one of the most controversial issues among PLHA where stigma and discrimination are real and palpable (Coll et al., 2015; Mmeje et al., 2016; Valencia-Garcia et al., 2017;). Most often, couples are judged by the public when they express their desire to build a family and have children. Generally, people consider this a taboo for HIV-affected couples having children of their own based on the possibility of transmitting the infection to their children or their uninfected partner. On the same note, health providers perceive that patients do not fully understand the necessity of viral suppression before sexual contact with their partners and safer conception methods and thinking that undetectable viral status is deemed in good health (Coll et al., 2015).

In the health sector, providers consider safer conception counseling as an effective means of reducing fears associated with childbearing (Mmeje et al., 2016; Coll et al., 2015). Through this, the best interest of supporting the reproductive autonomy among PLWH as persons are upheld and protected. A lot of effort still needs to be done in improving this practice through the conduct of formal training programs among the health care team and extending even to the community level in the hope that getting pregnant among HIV affected couple is possible and doable with very minimal risks (Mmeje et al., 2016; Coll et al., 2015).

Perception of health providers' attitude among HIV infected persons

There are reports where health providers' are biased against sex workers which come in forms of hostility and denial of treatment; blaming and shaming; long waiting lines; higher user fees; and even discriminatory treatment to family members (Scorgie et al., 2013). This finding is a cause of concern considering that these are patients who need attention due to the risk of contracting sexually transmitted infections. The exercises of biases in the health system are contributory to the double-stigma towards a high-risk group because of the nature of their job as sex workers, homophobia, and possibly HIV carriers. These vulnerable groups may be the contributors to the exponential rise of the HIV/AIDS epidemic and therefore needs due treatment and health management.

Literature suggests that stigma is an unavoidable circumstance that exists between the health care providers and PLHA and may come in varying degrees. The study of Valencia-Garcia et al. (2017), revealed that the experience of being stigmatized by health care providers is the most frequent distressing stigma. There are instances where patients experience many forms of maltreatment during care which may include the fear of being 'marked.' This raises the issue of the right to confidentiality. There are certain hospital routines and procedures which may deliberately jeopardize the patients' right to privacy. For instance, chart flagging to alert care providers on the HIV status of patients is a naive practice in the hospital. For health workers, this is a simple practice where its primary purpose only is to communicate and take precautionary measures in the health team (Valencia-Garcia et al., 2017; Stutterheim et al., 2014). However, this may already be considered as a breach of patients' right to confidentiality and is discriminatory. Physical isolation in the health care setup is another example of compromising patients' rights and cultivates a stigmatizing environment (Valencia-Garcia et al., 2017).

Nurses, Physicians, and other members of the health care team at the forefront play a crucial role in having HIV patients engaged in treatment and rehabilitation. Individual patients' outcomes lie in the hands of this team who provides direct contact to every HIV case. They must, therefore, be prepared and equipped with the necessary skills, especially in dealing with stigma and discrimination to strengthen the patient-provider caring relationship and retention to care. Magnus et al. (2013) surmised that when women and elderly patients feel they are being disliked to be cared for, or when they think their caregivers lack attention on them, they tend to lose interest in self-care and prefer a break or delay entry to HIV care. How patient perceives the health providers interest to help them cope with HIV as well as the overarching shame and stigma rooted from a myriad of sources are critical elements affecting patients' involvement and adherence to treatment.

The consequences of HIV/AIDS Stigma

A change in actions or dealings with a person for the reason of being an HIV carrier allows an atmosphere that stigmatizes the working relationship between care providers and patients. Zarei et al. (2015) revealed that the stigmatized attitude of health care personnel is found to be associated with unwillingness to provide services. This unwillingness to provide services is an intentional form of bias on the part of the provider, which may be interpreted as selective caring in a discriminatory environment. This inequity and the stigmatized situation between carers and patients are detrimental to the realization of patient satisfaction and improved health outcomes (Li et al., 2013).

Stigma acts as a significant barrier to treatment and cares for PLHA (Sison et al., 2013; Bofill et al., 2014). Similarly, the distance to treatment centers, access to treatment services, lack of HIV care providers, absence or lack of insurance coverage, medication shortages are factors inhibiting people from getting tested are contributory factors that dwindle adherence to HIV therapy (Servin et al., 2014).

Participating in focus group discussions where patients get to share their experiences has shown to improve familial and social relationships and help patients in the process of overcoming perceived stigma and improve their engagement in caring for themselves (Bofill et al., 2014).

Limitations of the Study

This study is not without limitations. First, the review is limited to three research databases, and only those within the years 2013-2018 were included; hence the results cannot claim generalizability. Second, the analysis made focused exclusively on the content and was not able to compare findings or perform a meta-analysis of the studies retained. Future researchers are encouraged to utilize a more extensive literature review.

Conclusion

The literature discussed that stigma on HIV/AIDS can come from a variety of sources such as family, partners, social circle, the community in general, and even among the healthcare team. Primarily it revealed that it is the lack of knowledge that contributes to stigma as experienced by MSM, sex workers, and HIV couples. Health workers understand the problematic situation of a PLHA. They believe they have a role to play in improving the lives of their patients by enhancing their knowledge, practice, and interactions with them. In contrast, a PLHA does not consider health facilities and health professionals as a refuge, but rather a perilous threat of stigma and discrimination experience. HIV/AIDS stigma is a barrier between the patient and the health care team and can lead to the detriment of the patient's health outcomes and satisfaction.

Implications to Practice

The issue of HIV/AIDS stigma and discrimination is a major issue that potentially affects patient-care provider interaction. It plays a crucial role in a successful working atmosphere between an HIV affected person and their health care provider as they both interact toward a safe and equitable care environment and achieve optimum health goals. How the health care providers perceive this concept is necessary to be appropriately identified and addressed accordingly, being persons entrusted by the self-stigmatized HIV/AIDS patients. Health care providers must show professionalism in dealing with these cases and avoid additional stressors that may be detrimental to the overall well-being of patients. The literature revealed that health care provider still needs more training in handling stigma and discrimination among patients with HIV. Patients also perceive this as existent and tangible in their experience in actual health care settings. Hence, a worldwide movement of capacity building on this matter is essential.

Conflict of Interest

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RESEARCH NOTE

Keeping at-risk youth at the center: lessons learned from a community-based participatory research Photovoice project in Taiwan

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Abstract

Youth in the foster care and juvenile justice systems have numerous unmet health needs and long-term negative health outcomes. Photovoice is a qualitative research method in which participants produce photographs and narratives to communicate their perspectives. While Photovoice has been used in various contexts relating to at-risk youth, no known study has been conducted among youth in the foster care or juvenile justice systems. However, numerous challenges exist for the inclusion of at-risk youth in research. Thirteen youth from a group home in Taiwan for teenage boys in the foster care and juvenile justice systems participated in this yearlong study which utilized a strengths-based approach to examine resiliency, their needs, and sources of support. After receiving in-depth training, participants spent three months taking photos and writing accompanying narratives relating to the research questions. Then, via facilitated individual and group discussions, participants selected photo-narrative pairings relating to five key themes, which were then used in exhibitions for local stakeholders. This article describes nine key lessons learned to keep at-risk youth at the center of future similar research studies through protecting, representing, and empowering them: 1) consider ethical challenges, 2) identify community partners, 3) develop mutual trust with participants, 4) use symbolism, 5) have a strengths-based approach, 6) allow participants to direct the process, 7) maximize time to develop participants' introspective skills, 8) disseminate study results widely, and 9) include participant empowerment as a key objective. Conducting research with at-risk youth is challenging but vital to identifying ways society can best support them. Photovoice remains a meaningful way for marginalized communities to articulate their needs and share their experiences and perspectives. Recognizing and addressing logistical and ethical challenges early can ultimately lead to more impactful studies for at-risk youth both individually and systemically.

Keywords: *Adolescent Health, Foster Youth, Vulnerable Populations, Community-Based Participatory Research*

Introduction

The term "at-risk youth" is defined as youth with an increased likelihood of unsuccessfully transitioning to adulthood (Koball et al., 2011). Youth in the foster care and juvenile justice systems have numerous unmet health needs and long-term negative health outcomes (Ahrens et al., 2014; Coffey et al., 2003). More research is needed to inform policies meant to address these youth's unique needs.

Top-down research is often employed when studying vulnerable youth. Although this approach can increase awareness of their challenges and needs, it is often much less illuminating than research in which youth participate and describe their own lives and priorities (Barman-Adhikari et al., 2019). Community-based participatory research (CBPR) is a framework that includes community members in the research process and has been widely used to examine health disparities (Wallerstein & Duran, 2006). CBPR among at-risk youth has been associated with positive outcomes, including increased self-efficacy and confidence, a desire to engage in service work, and decreased risky behavior (Garcia et al., 2014). Photovoice, a specific form of CBPR in which participants use photography and narratives to communicate their unique perspectives, has been used in various contexts with at-risk youth, including adolescents who are migrant workers, substance users, homeless, or from low-income and minority backgrounds (Barman-Adhikari et al., 2019; Bashore et al., 2017; Brazg et al., 2011; Kovacic et al., 2014; Yu et al., 2019).

However, numerous challenges, both logistical and ethical, must be considered when conducting qualitative research among marginalized populations, especially with CBPR. Research that discloses incriminating behavior and experiences of illness can be problematic, especially within small communities because of how disclosure may impact participants' relationships with community members (Teti et al., 2012). Research targeting disadvantaged groups can also lead to increased labeling, discrimination, and stigmatization (Walsh et al., 2008). With youth in the foster care and juvenile justice systems, their age and institutionalized status make it extremely difficult to have opportunities to work with them directly (Jeffords, 2007). It is also hard to longitudinally engage or study youth from these backgrounds because of home environment instability, limited engagement with educational settings, and numerous transitions (between family members, foster homes, and schools) (Barnert et al., 2014; Heath & Priest, 2016).

Due to these challenges, youth are often not included in the research meant to benefit them. Even when researchers seek to connect with these youth, trust may be more difficult to establish given these youth's difficult backgrounds. In qualitative studies, especially participatory research, developing trust before starting a study is critical to the study's success but is also a time-consuming process (Sprague et al., 2019). Teens may avoid conflict or differences in opinions to allow for decisions to be made more quickly, so researchers must be prepared to have a "critically curious standpoint" to avoid results becoming overly simplistic or merely reaffirming assumptions and generalizations (Dovey-Pearce et al., 2019). Participatory research also requires researchers to be open to the idea of multiple truths and leave behind a position of superiority, consciously seeking to minimize power differentials (Sprague et al., 2019). Furthermore, these youth often have decreased communication and literacy levels, due to factors such as schooling disturbances, and have low self-confidence regarding their educational and communication levels (Bryan et al., 2007; Hopkins et al., 2016). These youth, however, best understand their lived realities and thus it is imperative to include them in the research process.

Unique challenges further arise when studies are conducted internationally and cross-culturally. Research is often limited by available resources, especially time and money (Morse et al., 2007; Pischke et al., 2017). Gaining approval from ethics review committees may be a lengthy process, especially if approval from multiple countries is required and if committees have different ethical standards and protocols. International research teams may also encounter misunderstandings, scheduling delays, and poor coordination (Goddard et al., 2006; Pischke et al., 2017). If researchers, especially foreigners, do not share the same culture and are seen as outsiders by local participants, mistrust and misunderstandings may arise (Pischke et al., 2017). These issues may jeopardize the validity and trustworthiness of the data.

Research on at-risk youth is uncommon due to these reasons and international qualitative studies with this population are even more scarce. Currently, in Taiwan, the only known qualitative study that explores the perspectives and views of at-risk youth is the study that is the basis for the lessons learned in this paper (Hsiao et al., 2019). The objectives of this article are to describe the lessons learned from conducting a one-year community-based participatory research study among at-risk teenage boys.

Methods

Setting

This Photovoice study was conducted in Taiwan at a group home for teenage boys in the foster care and juvenile justice systems. All 26 boys at the group home during the study period were verbally invited to participate by the co-investigator and group home staff. Participant responsibilities and ethical concerns were communicated to participants and legal guardians before signing the consent forms. Monthly suicidal ideation screenings were implemented to ensure participant safety. Ethics approval was granted by National Taiwan University and the University of Southern California.

The on-site co-investigator was an ethnically Taiwan-Cantonese-American, Mandarin-speaking, US medical student who had previously volunteered at the group home for several weeks. The two study facilitators were a guidance counselor and social worker who had worked at the group home for more than ten years. Facilitator and participant training was adapted from one of the co-investigators' previous work and existing Photovoice manuals (Blackman & Fairey, 2007; Palibroda et al., 2009).

Training and Data Collection

The project's two main research questions were "how do at-risk youth view their lived experiences" and "how do these experiences relate to health and wellness?" To begin, weekly group trainings were held for two months which emphasized photography techniques, the use of symbolism, and ethical conduct. Participants then spent three months in data collection taking photos in response to the research questions and prompts, including topics such as sources of support, ways society can better support youth with similar backgrounds, and effective ways to relieve stress. After this data collection phase, each participant selected his top ten photos and wrote accompanying narratives. All participants had regular individual meetings with the research facilitators to discuss their work and address any questions or concerns.

Data Analysis and Dissemination

Through facilitated discussions, the participants sorted the top photos and narratives into key themes that they felt represented their individual and collective experiences and views. This work was then shared with local stakeholders through a total of 16 exhibitions in Taiwan. Additional presentations were given at various international conferences. Resource guides were also disseminated at exhibitions with tips for volunteering, effective ways to work with teenagers, and a list of local volunteer opportunities.

Findings

The results of this study are published elsewhere (Hsiao et al., 2019). Below are nine key lessons learned and recommendations to keep future similar CBPR studies focused on at-risk youth through protecting, representing, and empowering them.

1. Consider ethical challenges.
2. Identify community partners.
3. Develop mutual trust with participants.

4. Use symbolism.
5. Have a strengths-based approach.
6. Allow participants to direct the process.
7. Maximize time to develop participants’ introspective skills.
8. Disseminate study results widely.
9. Include participant empowerment as a key objective.

Discussion

1. Consider ethical challenges

The ethics approval process is critical to protecting participants but can be very lengthy due to the age and vulnerable status of youth. Starting early can prevent study delays. Gaining approval from two separate ethics review committees for this study required more than six months. Because neither committee was familiar with Photovoice, numerous in-person and email discussions helped the committee members to better understand how the study protocol ensured participant safety and dignity. For example, photos and narratives were blurred or edited to prevent identification of participants or described subjects and were individually reviewed with participants before inclusion in the exhibits to ensure that the work still matched and conveyed the participants' original intentions.

Identifying appropriate legal guardians for consent forms was also challenging because guardians either didn’t understand the consent forms or were unreachable (due to incarceration or recent death) and/or because social workers were uncertain who to contact as the guardian. The difficulties with the consent process highlighted deeper systemic issues relating to families and the child welfare system. The ethical challenges faced when working with this population must be considered to ensure they are protected in the research process but should be discussed and addressed early to minimize study delays.

2. Identify community partners

For any community-based study, especially if working internationally, having invested local facilitators and community members involved from the beginning is vital; they will have a deeper understanding of the local population, norms, cultures, and administration. Having local facilitators familiar with the youth allowed us to elicit genuine perspectives without causing re-traumatization and disclosure of information they might later regret sharing.

Many youths had limited experiences with success, delayed gratification, and/or long-term planning. As such, having facilitators familiar with the participants was critical to sustaining participants’ motivation, including identifying photography locations participants would enjoy and keeping friend groups together. Nonetheless, as expected, attrition occurred so it was helpful to have facilitators present the option of withdrawing but encourage them to complete the study.

The inclusion of local facilitators also led to greater opportunities to share the participants' work and research findings by establishing connections with other interested community stakeholders and identifying presentation opportunities.

3. **Develop mutual trust with participants**

In qualitative research, establishing a relationship of trust, and building rapport between the researchers and participants is critical, but is even more important with this population as many at-risk youth have insecurities, decreased trust, and/or past traumatic experiences. The study setting was selected because the onsite co-investigator had previously spent numerous weeks at the group home. The established relationship and regular interactions with participants allowed us to better ask questions, encourage them when they became frustrated, and give prompts when participants were unsure about what to photograph or how to express themselves.

Creating a safe space for a discussion led to more meaningful and open dialogue. Encouraging participants to discuss ideas or thoughts that they felt might be unfeasible or extreme also led to fruitful discussions about ways to support these youth. Establishing mutual trust was critical to ensuring that shared views and ideas were the youth's genuine perspectives.

4. **Use symbolism**

Participants' described topics were emotionally, and sometimes legally, sensitive. As such, symbolism was central to how topics and subjects were depicted in the participants' photographs. Thinking abstractly and utilizing symbolism were less familiar to participants, due to a combination of disturbances in the participants' schooling and decreased emphasis on these areas in the local education system. As such, many examples and practice exercises were included during the study's training and data collection phases.

Using symbolism allowed for the circumvention of the logistical challenge of photographing certain subjects, such as those that were legally sensitive or related to the past. Symbolism also helped to protect the participants' identities, thereby ensuring their safety and dignity. Symbolism in the photographs further elevated participants' voices as photographs did not directly depict the described subjects but rather represented the ideas and emotions being expressed by the participants (Creighton et al., 2018). The creativity and abstract depiction of certain themes and experiences also provided distance from painful experiences while making the work more compelling than if words were used alone (Kantrowitz-Gordon & Vandermause, 2016).

5. Have a strengths-based approach

Much of the research on the lived experiences of at-risk youth focus on past trauma, including family dysfunction, substance use, and histories of abuse or neglect. Inevitably, during discussions, participants shared negative past experiences, which were included in the study results. However, for both the purpose of empowering the study participants as well as seeking to identify possible solutions to the issues that are well-established in the literature, a strengths-based approach was used. We aimed to identify the participants' perceived sources of support, the aspects of their lives that had led to the development of resiliency, and their hopes and dreams for the future. In this process, we found that participants not only identified positive areas of their lives that they had previously not reflected on but also grew as they discovered new areas that they could continue to develop. Participants also learned from each other's insights during group discussions, which helped them realize that although they had had challenging pasts, they were not alone.

6. Allow participants to direct the process

Although at times we wanted to step in so that results better aligned with our views, giving participants autonomy throughout the study resulted in findings that more closely reflected participants' perspectives and increased participants' empowerment and self-esteem. During differences in opinions, we asked questions to stimulate discussion and avoided altering participants' decisions. We also used both individual and group discussions to promote diversity of ideas.

The photo sorting process required several different approaches. Most participants readily answered questions about their own lives but had more difficulty imagining other participants' perspectives and identifying common themes between photos and their shared histories and experiences. These challenges may be the result of participants' lower reading comprehension levels and the local education system's lesser emphasis on creative and critical thinking. Furthermore, numerous insightful comments came from quieter, but very reflective, individuals but sometimes only if they were given the space or asked to speak. Participants enjoyed seeing each other's photos but thought the sorting process was tedious and mentally tiring. We needed to prompt participants to explore and articulate the meaning of photos, beyond what was simply depicted. All photos and narratives were reviewed and approved by participants before the exhibitions.

7. Maximize time to develop participants' introspective skills

Introspection is learned and typically difficult among teenagers but even more so among at-risk youth. Many participants had difficulty writing their narratives due to factors including rarely being asked to express their opinions, lower communication levels resulting from constant disturbances in their schooling, and searching for "the right answer" since the local education system emphasizes memorization and less creativity and critical thinking. Understanding the participants' subculture but not belonging to it allowed us to approach the study with unique perspectives. During the introspective process, it was clear that the study provided an opportunity for the participants to see the value of and articulate previously unshared perspectives and experiences. Some participants preferred written (versus verbal) communication because of the distance and space it provided, as participants could work at their own pace to craft their narratives without facing our immediate reactions.

Knowing the challenges of introspection, we maximized the time for training, data collection, and data analysis, allowing us to get to know participants better and allowing them to explore the research questions in detail. This helped to ensure that they produced their best work without time constraints. In the three months of data collection, some participants felt like they did their best work at the beginning when they had the most momentum. But many others' best work was near the end as they grew more familiar with the process. One-on-one meetings with facilitators were frequent and kept short to account for participants' shorter attention spans.

8. **Disseminate study results widely**

We spent much time discussing systemic issues affecting at-risk teenage boys in Taiwan and what dissemination methods would most greatly impact community perspectives on these youth and potentially lead to policy change. Highlighting Photovoice's visual component and identifying invested local stakeholders increased our study's reach.

Working closely with community partners interested in the target population and who have the power to make the change is critical. We were fortunate to meet community partners who connected us to various organizations and institutions that were interested in the research findings and actively exploring ways to better serve this population. In the end, findings were presented at various international conferences and 16 exhibitions around Taiwan, and the work was featured in the newspaper and on television. Presentation sites included local schools, universities, hospitals, government offices, and group homes. Making presentations in non-academic settings accessible to the general public is key to promoting change within the community. Attendee feedback included developing greater empathy and understanding of at-risk youth, affirming the need for but also the rarity of hearing youth perspectives, seeing that fully supporting at-risk youth requires a multidisciplinary approach, and being impressed that the youth produced all the photos and narratives themselves. Providing resource guides (lessons learned and ways to get involved) can encourage meaningful change and attendees to get involved.

9. **Include participant empowerment as a key objective**

Empowerment is central to Photovoice but, like social or policy change, is a long-term process. Providing participants with autonomy throughout the research process allowed them to have control over the direction and results of the study. Individual meetings allowed for personalized feedback and safe spaces for voicing questions and concerns, while group discussions fostered increased conflict resolution skills. We also ensured that all participants had work in the exhibits, even though some participants were more skilled photographers than others. We communicated feedback from presentations to participants to make them feel engaged in the process even though ethical restrictions prevented their attendance.

Empowerment can be measured through individual surveys that collect quantitative and qualitative data about each step of the study, including assessment of what participants learned, behavior and attitudinal changes of participants, causes for these changes, and how the study compared to pre-study expectations. Our survey was based on a framework of degrees of empowerment: 1) does the choice exist? 2) does a person make that choice? and 3) will that choice result in the desired result? (Alsop & Heinsohn, 2005).

Participants' post-study surveys were overwhelmingly positive. They asked for a longer study period with more training and photo outings. Participants felt they developed new insights and perceived changes in themselves after reflecting on and sharing previously unvoiced experiences and feelings. These insights and changes included slowing down to think before acting, increased understanding of the relationship between behavioral choices and health, new ways to express themselves and more courage to do so, motivation to try harder in school, increased emotional stability and knowledge of stress relief techniques, greater acceptance of the past, increased perceived ability to overcome obstacles, feeling valued and having increased self-esteem, and more hope for the future. Some found this yearlong study to be particularly challenging, especially with introspection and abstract thinking. As a result, the exhibits were especially meaningful and gratifying to them as they saw the results of their yearlong commitment and perseverance.

Some participants felt that they did not gain better connections with other participants. The absence of increased connection might relate to these youth's high barrier to trust but could alternatively reflect that participants already had a high level of connectedness with each other since they live together. Some participants also indicated they did not feel like they developed advocacy skills, citing their inability to attend the exhibitions. But they did feel that the co-investigator was acting as their advocate. Empowerment is a long-term process and thus this study is meant to only play a part in promoting empowerment among the participants. Examples of participant feedback are included in Table 1.

Table 1. Examples of Post-Study Survey Feedback from Participants
"At first it was very boring. But afterward, I found that each photo was an opportunity to express myself…My biggest takeaway was better understanding my inner thoughts and how to express myself. I gained this through the teachers' guidance and taking time to reflect." -Kenny* (14 years old, grew up with an abusive father and came to the group home after running away from home)
"I have decided I don't need to be so shy and can courageously express my thoughts… The study was too short…At first, it was difficult to select [my top] photos but then I found it simple and interesting because I saw that different things have their masterpieces…I feel that the exhibit can allow more people to hear

and see our real thoughts."
-Joseph (17 years old, entered the juvenile justice system due to the theft)

"There was a big contrast between my pre-and post-study expectations. I never thought so many people would like my work…[Seeing the finished work] gives me a real sense of accomplishment...This activity can be run again to allow the younger boys to express their thoughts. If there are similar activities in the future, everyone can take the opportunity to participate."
-Will (15 years old, came to the group home due to domestic abuse at home)

*All names are pseudonyms

Limitations

Photovoice has been criticized for often simply creating awareness at the individual level and not leading to social justice amelioration or transformation (Sanon et al., 2014). Through the various exhibitions and news coverage, increased awareness and attitudinal changes occurred at both the individual and community levels. Many issues identified by the study were family-level or even greater systemic ones which will require much greater investment outside the scope of this study.

Implications

Conducting international CBPR with at-risk youth is not without its challenges. However, data generated directly by participants can provide unique insights that could be overlooked in traditional research methods that do not include them as an integral part of the research process. The Photovoice methodology proved to be a powerful and meaningful way to engage youth to tell their own stories and identify sources of strength and support, all of which was shared with local stakeholders to promote more awareness and community support.

Conflict of Interest

The authors have no conflict of interest to disclose.

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Author Contribution

Victor Hsiao: conceptualization of the study, data curation, formal analysis and investigation, funding acquisition, project administration, and writing of the manuscript. **Sunya Chen:** data curation, investigation, and project administration. **Mellissa Withers:** conceptualization of the study, formal analysis, and writing of the manuscript.

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RESEARCH NOTE

Establishing a Pilot Interprofessional Education Program in a Higher Education Institution in the Philippines

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Abstract

A pilot interprofessional education (IPE) program in the Philippines has been initiated in a private higher education institution by three Filipinos who were formally trained in IPE from a World Health Organization (WHO) Collaborating Centre for Research and Training on IPE. Guided by the WHO educator and curricular mechanisms on IPE and an understanding of the local context, a four-step action plan was created for the pilot IPE program, which involved 10 health science programs. The experience from the initial implementation was challenging and required perseverance as well as inclusive leadership. Nevertheless, the program's accomplishments such as continuous faculty training in IPE, constant communication among faculty members and students on IPE, and an inter-university collaboration to host the first-ever local IPE conference were noted. The article concludes with lessons learned from the pilot IPE program and future directions in further contributing to the growth and sustainability of IPE programs in the Philippines.

Keywords: *health professions education, collaborative practice, evaluation, educator mechanism, curricular mechanism*

Introduction

The World Health Organization (WHO) created a global Framework for Action on Interprofessional Education (IPE) and Collaborative Practice (CP) to help steer fragmented health systems into more collaborative ones (WHO, 2010). Its primary objective is to optimize health outcomes for patients and communities. Instrumental in achieving this objective, the WHO framework emphasized the role of higher education institutions (HEI) in developing learning programs that produce CP-ready healthcare workers who are competent in tackling current and future health needs.

Because every educational and health system is different, it can be a challenge to translate this framework into programs that are suited to address local needs and challenges. A group of faculty members from the Angeles University Foundation (AUF), certified IPE trainers from the WHO Collaborative Centre (WHO-CC) for Research and Training on IPE (Gunma University, Japan), took on this challenge. In this short report, we describe our four-step action plan in developing a pilot IPE program in AUF through the trainers' experiences in activating the strategies that shape how IPE is developed and delivered (i.e., educator and curricular mechanisms; WHO, 2010), to produce practice-ready health professionals.

Background

One of the thrusts of IPE is the alleviation of global healthcare workforce shortage (WHO, 2010) and its implementation in the Philippine education system may be beneficial in addressing the current shortage of Filipino healthcare professionals. Despite this potential, IPE in the Philippines remains a novel approach to healthcare education practice (Paterno & Opina-Tan, 2014).

AUF, a private university in Central Luzon (located about 80 km north of the Philippine capital of Manila), is one of the few universities in the region offering a wide range of degree programs in health sciences including medicine, nursing, pharmacy, medical technology, radiologic technology, physical therapy, and occupational therapy. Unfortunately, there was no IPE program being implemented within the university. Thus, faculty members who were certified IPE trainers took the initiative to develop an IPE course that can be integrated into all health science curricula of the university.

Although pushing for curricular changes within multiple degree programs to include IPE can be challenging, this initiative takes advantage of the current nationwide educational reform happening in the country. The reform mandates the transition of pre-tertiary education from a 10-year to a 12-year curriculum resulting in no new enrollees for academic years 2016–2017 and 2017–2018, as well as the call to promote transformative learning and 21st-century skills in higher education (WHO, 2013). HEIs, including AUF, are revising their curricular offerings to align them to the profiles of prospective university students. This allows the integration of IPE into each of the revised curricula rather than a mere addition to existing ones.

Approach

Three IPE trainers, faculty members from the university, worked together as the steering committee to establish a program called "Pilot IPE Program" in AUF. In late 2015, an initial meeting was held to outline the process of creating the program, distribute tasks to the team members, and identify possible obstacles throughout the process. Guided by the WHO's framework, particularly on the educator and curricular mechanisms and levels of engagement, a four-step action plan was created that spanned for three years.

Action Plan 1: Program Development

The IPE trainers scheduled several meetings in eight months (between 2015 and 2016) to discuss the contents of the IPE program. Initially, knowledge, skill, and attitude competencies were identified, followed by determining relevant topics, teaching-learning strategies, and assessment measures that will facilitate learning outcomes. The outputs of the meetings were synthesized in a Learning Activity Sheet (LAS).

Action Plan 2: Negotiation with University Administrators

While the initiative was from the "grassroots", a top-down implementation approach to spread IPE and CP within the university was preferred (Bishop, 2016). One of the problems foreseen was that other departments, aside from the home departments of the IPE trainers, would lack enthusiasm for or even reject this IPE initiative. Before this IPE initiative, different units had little to no interprofessional work between them and had reservations regarding sharing their authority over their department with members of other units. Part of the proposed solution was to seek the support of the university's administrators. It was easier to break barriers between departments and ask for human and material resources needed when the top management was tapped first. Nonetheless, constant conversations on IPE and CP with faculty members and students were equally necessary.

Action Plan 3: Implementation of a Pilot IPE Program

The pilot program was a four-hour activity that engaged 10 professions which began with two 20-minute lectures covering: (1) basic principles in IPE and CP and (2) IPE and CP process as applied in the local context. A short orientation on the workshop tasks was provided following the lectures. Thereafter, the cohort was divided into smaller groups to better facilitate discussion of a specific case vignette (i.e., medical, community health, and domestic violence/social issue). Guide questions were explicitly outlined in the LAS to structure their discussion (see Supplemental Material).

The IPE trainers facilitated team competencies such as (1) telling one's role to the team, (2) explaining observations and assessment, (3) agreeing on a collective plan for the team, and (4) moving as a team to accomplish the task of presenting outputs to the class. Steps one and two were done by presenting their uniprofessional roles, observations, and assessments in an interprofessional group. For steps three and four, participants were expected to agree or disagree as a team and consolidate their interprofessional care plans through a five-minute oral presentation. Finally, the IPE program concluded by asking volunteers to share their IPE experience with the whole class. Feedback was given both by trainers and participants. The experiences shared were transcribed for documentation. Likewise, photos and videos during these IPE activities were disseminated inside the university and in social media outlets.

Action Plan 4: Program Evaluation

Like any program, the pilot IPE program was designed and constructed including a program evaluation using the Context-Input-Process-Product (CIPP) Model (Stufflebeam & Shinkfield, 2007) three years after its implementation to determine the extent of the program's impact, strengths, weaknesses, and areas for improvement. Also, the results can be the basis for the future directions of the IPE program in AUF.

Findings

Our action plan involved identified key players who propelled the pilot IPE program and each plan was characterized by a specific level of engagement: contextualize, commit, and champion (see *Table 1*). *Contextualize* means agreeing to implement IPE-CP that would involve and benefit the local community. *Commit* refers to sustaining IPE programs through evidence generation (research and evaluation) and policymaking. *Champion* pertains to actively encouraging leaders in various institutions and management teams to share a commitment towards IPE and support its principles through policies, practice, and scholarship. Moreover, each strategy within the educator and curricular mechanisms based on the WHO framework (WHO, 2010) were explored by synthesizing the trainers' experiences (see Table 2). We would like to outline our findings by discussing the facilitators and barriers framed by the IPE educator and curricular mechanisms.

Introducing IPE through the implementation of a pilot IPE program in a private university required much time, physical and mental effort, effective communication, and commitment. Identified facilitators and barriers towards the success of this pilot IPE program were noted to be used later for program evaluation and revision. Moreover, to put a structure in evaluating the impact of the pilot IPE program, the strategies from educator and curricular mechanisms were juxtaposed with the experiences of the IPE trainers from the implementation of the pilot IPE program.

Educator Mechanism. Trained educators who are well-versed in facilitating IPE-CP competencies are crucial to the success of IPE within higher education institutions. They are expected to initiate a steering committee within the university that will lead in the training, program development, curriculum revision, manual creation, and championing of IPE to university officials, teaching staff, and surrounding communities.

Table 1. Summary of the four-step action plan including the timeline, key players, and level of engagement

Action Plan	Timeline	Key players	Level of engagement
Step 1 Program development	November 2015 to July 2016	IPE-CP trainers	*Contextualize*: The trainers have trained abroad and, during program development, they made sure to tailor-fit their learning into the local context.
Step 2 Negotiation with university administrators	July 2016 to August 2016	IPE-CP trainers, university officials (college deans, university president), HRDC	*Commit*: The university officials approved the program, which was consequently promoted by the HRDC. College deans encouraged their faculty members and students to participate in the pursuit of faculty development and extracurricular learning, respectively.
Step 3 Implementation of the pilot IPE program	September 2016 to December 2016	IPE-CP trainers, HRDC, faculty members, students, and non-teaching staff	*Commit*: The IPE trainers ensured that the pilot IPE program was framed within outcomes-based education and adult learning principles. The program was conducted on three distinct cohorts within the university.
Step 4 Program evaluation	July 2018	IPE-CP trainers, college dean, and participants of the pilot IPE program	*Champion*: The results of the program evaluation aims to guide the team in developing the IPE program and also identify an IPE champion per department who will sustain the cycle of IPE opportunities in AUF.

IPE, interprofessional education; CP, collaborative practice; HRDC, Human Resource, and Development Center

Curricular Mechanism. Being able to teach IPE is not enough because before implementing an instructional design, a well-planned curriculum must be installed first. It was advantageous that two of the IPE trainers were formally trained in educational sciences particularly on curriculum development. This factor is crucial in the development of the pilot IPE program. *Table 2* summarizes how the IPE trainers strategized to ensure that learning activities, expected outcomes, and assessment of learning are interlinked to achieve effective IPE in AUF.

In terms of educator mechanisms, barriers arose from managerial commitment. Even though constant dialogue with the administration, teaching staff, and non-teaching workers in the university existed, their initial engagement might be inconsistent or even absent due to priorities, values, and openness to new ideas. However, with the presence of institutional support as well as champions who were formally trained in IPE and educational sciences, the commitment of faculty and staff to join the pilot program was further facilitated, evidenced by the successful IPE program implementation to over a hundred participants.

On the other hand, barriers to curricular mechanism could be from logistics and scheduling. The date was moved three times because of calendar changes. The bureaucracy of communication with colleges, departments, and units was one of the most challenging aspects of the project. There was a particular college that was particularly unenthusiastic about the idea and the trainers would have to utilize strategies that would showcase the benefits of the program to their faculty members and students. Another hurdle was the short amount of time given for the program. Ideally, an IPE program would have more than one session stretched within a week or a month. During the next program implementation, the IPE trainers also intend to resolve the following: making attendance compulsory and involving a graded

Table 2. Experiences of trainers in applying the educator and curricular mechanisms for the pilot interprofessional education (IPE) program

Educator Mechanisms	AUF Experience	Curricular Mechanisms	AUF Experience
Champions	The IPE trainers championed IPE in AUF and shouldered the necessary work to move the IPE initiative from plans to a working pilot program.	Logistics & scheduling	The IPE "champions" of AUF managed the logistics of the IPE initiative and were flexible in accommodating scheduling differences between different departments
Institutional support	Support from the university administration was sought at the beginning and this made the whole process easier. Before this, the IPE trainers faced a lack of cooperation from other departments.	Program content & learning methods	Because AUF has no IPE courses, the pilot program always began with an introduction of IPE concepts. A case discussion follows the lecture and it ends with a short presentation from each group about their learning.
Managerial commitment	With a shared vision, the IPE trainers constantly engaged the faculty members and non-teaching staff in formal and informal dialogues. Different units were invited to participate, support, and contribute to the IPE initiative.	Shared objectives	Despite each group being composed of persons with a different professional background, the learning objectives were crafted for them to accomplish one goal. The lecture on the IPE concepts also provided everyone with the same background knowledge on IPE.
Learning outcomes	Learning outcomes were adapted based on learners' profiles in each cohort (undergraduate students,	Contextual learning	Case studies were based on health and social issues relevant to Filipinos (e.g., poverty, domestic violence, environmental pollution,

Educator Mechanisms	AUF Experience	Curricular Mechanisms	AUF Experience
	graduate students, and faculty members).		and lack of healthcare access).
Staff training	The program is considered the first staff training on IPE. Thereafter, the faculty members who attended the pilot program would adapt it to suit the needs of their respective departments with the assistance of the IPE trainers.	Assessment	The pilot IPE program utilized the Attitudes Towards Health Care Teams Scale (Heinemann et al., 2002) for the assessment of team attitudes towards IPE-CP and the institutional teacher's evaluation. Moreover, a formal program evaluation is scheduled to gain further insights regarding curriculum (re)design.

AUF, Angeles University Foundation; CP, collaborative practice

assessment. With many aspects to improve on, the program content already consisted of achievable learning outcomes and used various learning methods grounded on adult learning principles. Ultimately, the accomplishments and points for improvement from the experience must point back to the goals of IPE-CP, which are to produce graduates who are CP-ready and develop faculty members to be outcomes-focused and transformative educators. One educator participant even mentioned, "Knowing other professions' roles within the team helped me understand and perform my role better", a comment that attested to how these two goals were achieved from the pilot IPE experience.

Lastly, program evaluation using the CIPP model was employed. It was carried out through a focused group discussion and results were categorized based on the four aspects of the model as outlined in Table 3. The results of the program evaluation reflected aspects of the pilot IPE program that need to be addressed including facilities, sustainability, departmental initiatives, research, and staff training. Utilizing the CIPP model ensured that the four areas of the pilot IPE program—namely context (overall goals and missions), input (plans and resources), process (activities or components), and product (outcomes or objectives)—were assessed. Consequently, the results of the program evaluation provided evidence-informed decisions to upscale the existing IPE program in AUF.

Table 3. CIPP evaluation of the interprofessional education (IPE) pilot program in the Angeles University Foundation (academic years 2015-2018)

CIPP Aspect	Purpose	Findings
Context	Establish the needs which the program aim to fill and identify the social, political, and cultural factors that would influence the success of the IPE program	• *Needs*: lack of collaboration in actual practice, open-mindedness, awareness of other health professions • *Opportunities:* IPE can enhance collaborative practice and there is no IPE program established yet • *Problems:* lack of awareness on how to implement and sustain IPE program, the domination of one profession within the health care team, limited promotion and awareness of IPE, and perspectives that IPE may not work

CIPP Aspect	Purpose	Findings
		in the Philippines
Input	Identify material, time, resources needed for the IPE program	• Case vignettes that are timely and contextualized • Variety of methods to facilitate IPE training aside from the *KJ method** • Inclusion of aspects of spiritual health • Specific point persons and appropriate continuing faculty development programs to train facilitators
Process	Monitor whether program activities are carried out as planned	• Implemented in some classes but barriers are also evident • The idea is something that is not new in the field but is not referred to as IPE and collaborative practice • Should be implemented after their training in their respective classes • Not fully implemented due to facilities and scheduling of classes
Product	Assess the outcome of the program	• More positive attitudes towards IPE • Increased interest in venturing into IPE-related researches • No established network yet to further promote IPE and collaborative practice • A limited number of IPE-related researches • No integration of IPE yet in the curriculum

*The Kawakita Jiro Method or "KJ Method" is a Japanese problem-solving approach utilizing divergent and convergent thinking, idea crystallization, and idea-verification (Kunifuji, 2016). This method is characterized as a post-lecture workshop where participants are divided into small groups to discuss a question or a topic. Each participant in a group is allowed to discuss or answer a question by writing their ideas on paper cards, which will then be arranged according to themes on a board or manila paper. The participants may then decide to add arrows, color coding, and drawings to visualize and to convey meanings and associations among the ideas. The end product is an idea board that can be used for oral presentation later post-workshop

Lessons and Future Directions

Based on the action plan described above, we would like to highlight accomplishments, identify present barriers, and articulate future directions of this pilot IPE program. The consideration of the educator and curricular mechanisms described in the action framework (WHO, 2010) guided the trainers to devise context-focused actions in implementing IPE and CP in AUF. Trained educators who are well-versed in facilitating IPE and CP competencies were crucial to the successful implementation of the pilot IPE program. Barriers remained to be the managerial commitment to install a novel approach such as IPE due to different institutional priorities. Nonetheless, two new faculty members who were recently trained in IPE under the WHO-CC were assigned to form the IPE committee that would lead in integrating IPE and CP competencies within certain courses in different curricula enabling greater fluidity among faculty members across departments. To sustain this, an IPE champion would be assigned per department and the IPE program is expected to be done in another cycle to activate the integration of IPE within health science curricula in the next three years. While the four-step action plan provided structure in the development of the pilot IPE program, a more rigorous development process may be followed such as the "Interprofessional Education Guidelines 2017" released by the Center for the Advancement of Interprofessional Education (Barr, et al. 2017) to ensure improvement and sustainability of IPE within AUF.

Alternatively, the heightened awareness of IPE and CP among the faculty members and students also ignited AUF to collaborate with another private university to host the first-ever "Philippine Interprofessional Education and Collaboration Conference" held last 11–12 August 2018 in Manila, Philippines. The post-conference workshop instigated the establishment of the informal and online group for Filipino IPE champions called the "Philippines Interprofessional Education and Collaboration Network" (PHIPEC Network) (Sy et al., 2019). To uphold all the level of engagements—contextualize, commit, and champion—AUF collaborated with the PHIPEC Network and two other private universities to host the 2nd Asia Pacific Interprofessional Education and Collaboration and PHIPEC Network Joint International Conference entitled "Transforming Asian Healthcare and Social Welfare through Interprofessional Education and Collaboration in the 21st Century" (see https://www.phipecnet.org). Additionally, AUF has since continued demonstrating commitment towards IPE and CP through community extension projects that emphasize upskilling CP competencies among health care profession faculty members and students as well as evidence generation of Filipino students' readiness towards IPE (Cervantes-Sudio et al., 2020).

Navigating the bureaucracy and governance within higher education could be overwhelming especially when novel ideas and approaches are being introduced. The experience of AUF is a testament that establishing an IPE program is challenging and requires perseverance. However, inclusive leadership and being constantly mindful of different levels of leadership engagement made the whole experience worthwhile.

Hence, the following key lessons were learned throughout the experience:

- *Early planning.* Planning early and setting a timeline is crucial to involve more professions, secure adequate resources, minimize logistical difficulties, and allow ample time to negotiate with university officials. Moreover, it is strategic to establish rapport with the university units involved through the process of implementing the action plans. Likewise, a plan to evaluate the program must be set and scheduled to monitor the (non)achievement of targeted outcomes and to inform the college and university on the decisions to be made for IPE.
- *Professional identity.* Having a professional identity is advisable when joining the IPE program. Having this competency enables participants to share based on their professional background producing valid assumptions for their colleagues during discussions resulting in richer interprofessional learning and exchange.
- *Congruence between learning and adult learner.* In designing an IPE program, it is crucial to tailor-fit the learning outcomes, teaching-learning strategies, and assessment methods to the learners' profile. The case vignettes should be crafted to reflect health and social issues that are relevant and timely to activate the sharing of opinions, insights, and personal experiences.
- *Documentation.* The habit of documenting via written works, photos, videos, or social media makes the IPE program establishment more official, evidence-generating, and organized. The

raw data collected throughout the documentation process eases the process of information dissemination via presentation, publication, or grant application.

We hope that this *Research Note* provides health and caring sciences educators, scholars, and program developers a guide to design and redesign innovative programs introduced within higher education institutions. While the four-step action plan is not prescriptive, this article intends to propose that each program must be grounded on theoretical frameworks, contextualized based on the needs of the end-users and stakeholders, and sustained through committed scholarship and deliberate translation of research to actual products that will benefit both the education and health systems.

Conflict of Interest

The authors have no conflict of interest to disclose.

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Author Contribution

Michael P. Sy: study conceptualization, program development, and evaluation, project administration and supervision, writing-original draft preparation, writing-review, and editing. **Roi Charles S. Pineda**: study conceptualization, program development, and evaluation, writing-original draft preparation, writing-review, and editing. **Reeva Ann L. Sumulong**: study conceptualization, program development, and evaluation, writing-review, and editing. **Annalyn T. Navarro:** study conceptualization, project administration, and supervision.

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LETTER TO THE EDITOR

Disaster Risk Reduction: High Time We Address the Education and Practice Gap

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Dear Editor:

In light of typhoons Rolly (Goni), Siony (Atsani), and Ulysses (Vamco) that have caused disastrous flooding and subsequent losses to both human life and property, the importance and implications of the study Disaster Risk Reduction Knowledge among local people in a Selected Community in the Philippines (Soriano, 2019), cannot be discounted. A disaster as defined by the United Nations International Strategy for Disaster Reduction (2016) is "a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its resources" (Najafi et al., 2017). Soriano (2019) described the sampled community members from Taytay, Rizal to possess a fair knowledge of disaster-related knowledge and disaster risk perception, good knowledge of disaster preparedness and readiness, disaster adaptation, and disaster awareness. Soriano also determined possible relationships between respondents' age, sex, civil status and educational attainment, and the community's level of disaster risk reduction (DRR) knowledge. None of the tested sociodemographic variables were seen to be correlated to the community's overall good level of DRR knowledge. I appreciate the study's contribution to local knowledge on DRR. I want to take this opportunity to motivate our readership to help bridge the DRR knowledge and practice gap through research.

Various Philippine agencies, local government units, and organizations may benefit from future studies that opt to include other variables like level of income, house ownership status, collective efficacy, locus of control, fatalism, anxiety, previous disaster experience, community participation and empowerment, responsibility towards others, and available resources in their analyses of DRR education (van Valkengoed & Steg, 2019). If any of them are seen to have a relationship, causal or otherwise, with DRR knowledge, these variables can offer various institutions and organizations valuable insight into improving communities' collective knowledge.

In evaluating the effects DRR knowledge may have on DDR practices or behaviors, future researchers may look into framing their questions within various behavioral theories or models (Najafi et al., 2017). Research on DRR practice and behavior may utilize the social ecologic model, social cognitive theory, the transtheoretical model of change, the health belief model, the theory of reason action, and the technology acceptance model, which may provide a new perspective on Filipinos' DRR practices or behaviors. Testing the applicability and significance of these theories or models in the local context may better inform policy. Insights derived from theoretical inquiries may scaffold more efficacious behavior change interventions built on the existing DRR education programs.

The Philippines' many cultures, unique geography, and geologic features provide diversity in natural disasters' experiences based on which island, region, city, or municipality one is currently in. It could then be implied that a community's DRR knowledge and behaviors and their collective perception of the disaster-related risks may be vary based on their locale's predisposition to natural disasters. For this reason, I find the choice of Taytay, Rizal as research local to be interesting. The municipality of Taytay is often spared and is projected to be relatively safe from disastrous levels of flooding (DOST-UP DREAM & Phil-LiDAR Program, 2017) owing to its relatively higher elevation when compared to neighboring municipalities in the province of Rizal that have been hit the hardest by flooding due to rainfall from the series of typhoons. I recommend that replication and extensions of Soriano's study be done in areas that are historically more prone to natural disasters. Replication of this research across other disaster-prone locales in the Philippines may provide a basis for a comparative analysis of DDR education programs' efficacy.

In closing, the work of Soriano (2019) should stimulate researchers to look into the reasons why many Filipinos failed to act accordingly based on DRR knowledge despite an acceptable or good level of DRR knowledge. We should continue researching ways to bridge the DRR education and practice gap. We can, through evidence-based and evidence-inspired research, help build more disaster-resilient communities in the Philippines.

Conflict of Interest

The author has no conflict of interest to disclose.

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The artwork illustrates a blooming flower hence, calling it "The Bloom." The inspiration for this piece of art is based on how care is manifested in the human health experience. Just like a flower, the humans person needs care to fully realized their potentialities. Caring is both a human characteristic and a professional identifier. Though caring is expressed in varied ways, in the end, what matters most is how the individual deliberately participate in their experience of care aimed towards their growth and wellness.