Determinants of Sexual Literacy of Senior High School Students in De La Salle University-Manila

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Abstract: Sexual literacy is an important aspect of the formative development of individuals as it influences their capacity to think about and act upon factors affecting the sexual aspect of their lives. However, achieving a certain level of sexual literacy is still a complex path in society, especially in prestigious schools in the Philippines such as De La Salle University Manila (DLSU-M). This study aims to assess DLSU-M Senior High School (SHS) students' level of sexual literacy, determine factors significantly explaining it, and form statistical models based on the significant factors. Both Poisson regression models and Logistic regression models revealed significantly higher sexual literacy scores among students with Chinese ethnicity, teacher as main source of information on relationships and sex, and mother as secondary source of information on reproductive health. Furthermore, Poisson regression models also revealed that favoring Lesbian, Gay, Bisexual, Transgender, Queer and/or Questioning, Intersex, Asexual and/or Ally, and others (LGBTQIA+) rights is also a significant predictor of sexual literacy. Therefore, educators such as parents and teachers positively impact an SHS student's sexual literacy. Their immediate environment is especially significant in honing their comprehension regarding sexual and reproductive health, thus, a more open yet secure space must be reinforced.

Key Words: sexual literacy; shs students; reproductive health; developing countries; education

1. INTRODUCTION

Philippine society has been conservative and uptight when it comes to addressing issues regarding sexuality and reproductive health -- leaving the youth at risk for unplanned pregnancies, sexually-transmitted diseases, and other related complications. The 2017 Annual Poverty Indicator Survey (APIS) revealed that there are 3.6 million out-of-school youth deprived of quality education in both aspects of academics and morals (Philippine Statistics Authority (PSA), 2017). Millions of children are at risk because they have insufficient knowledge regarding sexuality and health.

According to the Young Adult Fertility and Sexuality Study (YAFS) in 2014 and 2016, lack of sex education, prevalence of poverty, culture, religion, perceived inappropriateness of the discussion of sex at home, gender, and sexuality variables may also contribute to sexual literacy.

Sexual literacy is a concept and skill which must be integrated into the education of the SHS students, as it contributes greatly to their sexuality and reproductive health protection. Assessing the sexual literacy of SHS students reveals certain gaps in their education. Fulfilling the following objectives may allow the formation and implementation of a more strategic and systemic solution in honing students' sexual literacy.

This study aims to profile DLSU-M SHS students in terms of sexual literacy, identify the determinants of these students' sexual literacy, and build statistical models of sexual literacy based on its significant determinants. Through appropriate statistical tests and modeling procedures, it offers interpretations for the possible relationships between sexual literacy and the different determinants.

2. METHODOLOGY

2.1 Research Design

This study is quantitative in nature, and utilized appropriate statistical analyses to determine factors explaining sexual literacy of DLSU-M SHS students.

The dependent variables are objective multiple choice questions to assess the respondents' sexual literacy based on knowledge on (1) sexual mechanisms (four items, cronbach's α = 0.70), (2) HIV/AIDS (two items, cronbach's α = 0.88), (3) contraception (six items, cronbach's α = 0.66), and (4) LGBTQIA+ terminology (eight items, cronbach's α = 0.74). Each subsection was considered a separate dependent variable, and the cumulative score worth 20 points was also a separate variable, for a total of five dependent variables in this study.

Meanwhile, the independent variables include personal information, attitudes toward sexuality, sources of information on sex, etc. For the complete list of independent variables, see Table 12 in the Appendix.

2.2. Sampling and sample size

From the population of consenting SHS students, N = 1133, the initial sample size, n = 385 was calculated using 5% sampling error (Demographic Research and Development Foundation Inc. [DRDF] & University of the Philippines Population Institute [UPPI], 2016), 95% confidence interval (Alzate et al., 2020), and a 0.5 estimate of true proportion, which gives the maximum possible sample size. Considering this sample size was more than 5% of the population, Finite Population Correction Factor (FPC) was applied, resulting in a final sample size of n = 288.

Respondents were sampled randomly from the said population using stratification according to batch since grade 12 students have likely adjusted to the culture and norms of the school while the grade 11 students are newcomers and probably still have the mindset they have from their previous schools. Cluster sampling was also done by taking random samples from the class sections of grade 12 and grade 11. This method was used as the samples that were taken from each batch are heterogeneous due to their various personalities and backgrounds. Out of the 677 students in the sampled clusters, 289 responded, which satisfied the required 288.

2.3. Data Analysis

Descriptive statistics were calculated to present a basic level of understanding of the sample. However, since these values are restricted to the sample, inferential statistics were processed in order for conclusions to be drawn about the entire population in this study.

Hypothesis tests were carried out to compare two or more groups classified by the categorical independent variables in this study. Non-parametric tests such as the Mann-Whitney U test (for exactly two groups) and Kruskal-Wallis H test (for at least two groups) were used to determine whether or not there was significant difference in sexual literacy among the groups at the 0.05 significance level.

The parametric counterparts of these tests were not used since the sample values from the five dependent variables failed to satisfy the common assumption of normality. In particular, the Kolmogorov-Smirnov test for normality revealed five p-values less than 0.01, rejecting the null hypothesis of normality.

Poisson regression and logistic regression were used to analyze all independent variables simultaneously, and determine which of these explain sexual literacy at α = 0.05. The five dependent variables in this study are count variables, which fit the requirements of Poisson regression. For its execution, backward elimination was done using Statistica wherein the variable with the highest p-value at every run was eliminated until only significant ones remain at =0.05. The multiple Poisson regression model is as follows

$y = +1x1+2x2+\ldots+ kxk$

where y = dependent variable; x1,x2,…,xk= significant independent variables; 1,2,...,k = estimated coefficients

Exponentiating both sides assures that the right hand side of the equation has a positive value, allowing for a practical interpretation of data. This model will reveal the actual estimated score based on the values of the significant factors.

$y=+1x1+2x2+\ldots+kxk =e(e1)x1(e2)x2(ek)xk$

Logistic regression was used as a secondary model to explain other possible variable relationships, and assumes that the dependent variable has two values encoded as "0" and "1." In this study, these values are low literacy (at most half of the total score) and high literacy (more than half of total score), respectively.

The four levels of health literacy of the European Health Literacy Survey (HLS-EU-Q47) are 'inadequate' (0–25), 'problematic' (>25–33), 'sufficient' (>33–42), and 'excellent' (>42–50) (Sørensen et al., 2015). In this study, the 'inadequate' level or half of the total score was considered low literacy and high literacy was the aggregation of the 'problematic', 'sufficient', and 'excellent' levels, which is equivalent to greater than half of the total score.

3. RESULTS AND DISCUSSION

3.1 Descriptive Statistics

With 95% confidence, the mean sexual literacy score in the population of all DLSU-M SHS students is between 12.8 and 13.6 out of 20. Since the interval is higher than half of 20, the mean sexual literacy score is considered high.

Table 1. Descriptive Statistics

	kno_sexm	*kno_hivs*	*kno_cont*	*kno_lgbt*	*kno_tot*
Mean	3.00692042	1.59861592	2.6816609	5.9031142	13.190311
Median	3	2	3	6	14
Mode	3	2	3	7	15
Standard Deviation	0.90903291	0.62204704	1.4052392	1.7651007	3.4098167
Skewness	-1.019088	-1.29459869	0.2021728	-0.7826178	-0.6089483
Range	4	2	6	7	17
Minimum	0	0	0	1	3
Maximum	4	2	6	8	20
95% CI	[2.9, 3.11]	[1.53, 1.67]	[2.52, 2.84]	[5.7, 6.11]	[12.8, 13.6]

3.2 Basic Inferential Statistics

3.2.1 Mann-Whitney U test

There is no significant difference between biologically male and female students in terms of their knowledge in sexual mechanisms, HIVs, reproductive health, and gender and sexual orientation.

Table 2. Mann-Whitney U Test by Sex Assigned at Birth

Variables	kno_tot	kno_sexm	kno_hivs	kno_cont	kno_lgbt
Value of test statistic	9860.0000	10333.0000	9671.0000	10164.5000	9041.5000

*significant at 0.05 level of significance

3.2.2 Kruskal-Wallis H test

At α = 0.05, students' academic strands, sexual orientations, and romantic orientations each have a significant relationship with total score and with score in the gender and sexual orientation portion of the exam. Moreover, students of various gender identities also have significantly different scores in the sexual mechanisms section, implying that being part of the LGBTQIA+ community might increase students' knowledge on gender and sexuality. Furthermore, students of various ethnicities have a significant difference in their score in the same section, implying that people from different cultural backgrounds may have different perspectives when it comes to sexual engagement.

However, no significant variables were found to explain the scores in both the HIV section and the reproductive health knowledge section.

Table 4. Kruskal Wallis H Test by Independent Variables with More Than Two Categories

	Value of Test Statistic				
Variables	(kno_tot)	(kno_sexm)	(kno_hivs)	(kno_cont)	(kno_lgbt)
Strand (sfc_shss)	14.6000*	8.9513	2.8714	9.1815	11.1735*
Sexual Orientation (pin_sexo)	15.8891*	4.1259	1.7500	3.7745	30.6889*
Romantic Orientation (pin_romo)	11.8223*	2.4083	5.1943	2.5884	24.7057*
Gender Identity (sfc_geni)	6.3382	1.1161	4.2823	2.6067	19.7018*
Ethnicity (sfc_ethn)	20.5851	21.2982*	13.0935	12.6613	17.2176

*significant at 0.05 level of significance

3.3 Statistical modeling

3.3.1 Poisson regression

The factors that significantly explain total score are att_right (favoring LGBTQIA+ rights), eth_chi (Chinese ethnicity), mrel_tea (teacher as main source of information on relationships and sex), and srep_moth (mother as secondary source of information on reproductive health).

Those who selected mrel_tea have a total sexual literacy score that is $e^{0.097711} \approx 1.1026$ times the score of those who did not, with other factors held constant. Additionally, the population who selected srep_moth has a total score that is $e^{0.094930} \approx 1.0996$ times that of those who did not, all other things being the same. These imply that educators such as teachers and parents are major influences on SHS students' sexual literacy.

Table 4. Poisson Regression on Total Sexual Literacy Scores

Effect	Estimate
Intercept	2.28899*
eth_chi	0.049417*
srep_moth	0.094930*
mrel_tea	0.097711*
att_right	0.313338*
att_right	-0.451614*
att_right	0.011175

*significant at 0.05 level of significance

The following results show that the reproductive health exam score of students who selected mrel_tea is $e^{0.184536} \approx 1.2027$ times the score of the others, holding other factors constant. This is because perhaps, schools' curricula focus on this topic. Meanwhile, students who came from technical schools (jhs_tech) have a score that is just $e^{-0.577885} (\approx 0.5611)$ times that of the other students, with other factors held constant.

Table 5. Poisson Regression on Reproductive Health Section

Effect	Estimate
Intercept	1.398411*
mrel_tea	0.184536*
jhs_tech	-0.577885*

*significant at 0.05 level of significance

The factors that explain knowledge regarding gender and sexual orientation are kina_plat (have experienced platonic attraction), att_cohab (is against cohabitation before marriage), and srep_moth.

The model shows that the experience of platonic attraction lowers kno_lgbt, leading a student's score to be multiplied by $e^{-0.096332} \approx 0.9082$, holding other factors constant. Meanwhile, those who strongly disagree that cohabitation before marriage is wrong have their scores multiplied by $e^{0.208066} \approx 1.2313$, showing that openness to different family and household structures may be linked to awareness of gender, sexual, and romantic minorities.

Table 6. Poisson Regression on Gender and Sexual Orientation Section

Effect	Estimate
Intercept	1.493302*
kina_plat	-0.096332*
att_cohab	0.208066*
att_cohab	0.136577*
att_cohab	0.014637
srep_moth	0.117150*

*significant at 0.05 level of significance

There were no significant determinants for sexual mechanisms and knowledge of HIV at $\alpha = 0.05$. This means that scores in these sections do not depend on the independent variables in this study.

3.4 Logistic regression

Backward elimination was also utilized for logistic regression. The indicated odds ratios are the quotients of the odds of "success" (high literacy) over the odds of "failure" (low literacy). Exception is in the reproductive health section where the assignment of "success" was reversed, since the majority of the respondents failed in this section.

Among the significant predictors of kno_tot, kina_plat has a negative coefficient and an odds ratio less than 1, suggesting a small difference in odds. This indicates that a student who experienced platonic attraction has an odds of having a high level of literacy that is 0.287186 times lower than that of a student who experienced a different kind of attraction, holding other factors constant. The same applies to roma_many (attracted to more than one gender) and shs_stem (STEM strand). However, eth_chi has a positive coefficient and an odds ratio greater than 1, suggesting that the odds of a student, whose ethnicity is Chinese, having a high level of literacy is between 2 to 3 times higher than that of a student who has a different ethnicity, with other factors held constant. The same applies to mrel_tea and srep_moth.

Table 7. Logistic Regression on total Literacy Scores

Variables	Estimates	Odds Ratios
roma_many	-0.853256*	0.181498
eth_chi	0.458491*	2.501730
shs_stem	-0.386135*	0.461963
mrel_tea	0.592494*	3.270647
srep_moth	0.661503*	3.754689
kina_plat	-0.623812*	0.287186

*significant at 0.05 level of significance

Among the significant predictors of kno_sexm, the variable shs_stem has a negative coefficient and an odds ratio less than 1, which indicates that the odds of a STEM student having high level of literacy is 0.542669 lower than a student with a different strand, all other things being the same. However, eth_fil has a positive coefficient and an odds ratio more than 1, with students whose ethnicity is Filipino having higher literacy. The same applies to eth_chi and mrel_tea.

Table 8. Logistic Regression on Sexual Mechanisms Section

Variables	Estimates	Odds Ratios
shs_stem	-0.305628*	0.542669
eth_fil	0.594238*	3.282074
mrel_tea	0.942031*	6.580176
eth_chi	0.418212*	2.308101

*significant at 0.05 level of significance

Meanwhile, kno_hivs did not have any significant predictors.

Among the significant predictors of kno_cont, kina_alt has a negative coefficient and an odds ratio less than 1, which indicates that a student who experienced alterous attraction have an odds of having low level of literacy that is 0.368482 lower than a student who experienced a different kind of attraction, all other things being the same. However, mrep_moth has a positive coefficient and an odds ratio more than 1, in favor of students whose mothers are their primary source of information on reproductive systems. The same applies to form_sem (formally received sexual education in a seminar).

Table 9. Logistic Regression on Reproductive Health Section

Variables	Estimates	Odds Ratios
mrep_moth	0.635923*	3.567431
form_sem	0.353902*	2.029528
kina_alt	-0.499181*	0.368482

*significant at 0.05 level of significance

Among the significant predictors of kno_lgbt, the variable jhs_public has a negative coefficient and an odds ratio less than 1, which indicates that the odds of a student who attended a public school prior to transferring to DLSU having a high level of literacy is lower by approximately 0.171402 than a student who attended a different type of school, with other factors held constant. The same applies to shs_stem, kina_plat, and kina_sex (experienced sexual attraction). However, students whose preferred source of information on reproductive systems is their father (pref_fath) and whose primary sources of information on reproductive systems are friends (mrep_frnd) have higher literacy, as these variables have a positive coefficient and an odds ratio more than 1. For pin_nore, which is a continuous predictor, every additional sibling whom a student has results in a multiplicative impact of e0.423021 (1.52657) in the odds of having a high level of literacy.

Table 10. Logistic Regression on Gender and Sexual Orientation Section

Variables	Estimates	Odds Ratios
kina_plat	-0.882578*	0.171160
pref_fath	0.946681*	6.641655
shs_stem	-0.426223*	0.426371
pin_nore	0.423021*	1.526566
jhs_public	-0.881872*	0.171402
mrep_frnd	0.832540*	5.286097
kina_sex	-0.642224*	0.276803
srel_avm	0.830327*	5.262749

*significant at 0.05 level of significance

4. CONCLUSIONS

The educational and moral environment of the SHS students in school and at home greatly influence their sexual literacy. It was found that having teachers and parents, and being able to access multimedia information positively influence their sexual literacy objective exam score. Although results were positive, the education of these students may still be developed and improved as the majority of them failed the reproductive health section. More in-depth discussions must be done and a stronger feeling of trust and comfort must be established between these students and those in authority to widen their understanding of sexual and reproductive health.

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