ABSTRACT

A SURVEY OF HUMAN PAPILLOMAVIRUS (HPV) KNOWLEDGE OF VOLUNTEER UNIVERSITY FEMALE STUDENTS, RESIDING IN SOUTHEAST TEXAS

HPV is the most common incurable STI in the U.S. 79 million people are infected, with 4,092 female deaths, and 12,109 diagnosed cases. It is diagnosed by a Pap and HPV test. Women ages 20-24 are at higher risk. The purpose of this study was to survey HPV knowledge in volunteer female, university students. The NCI’s HINTS survey was administered to a convenience sample ages 18-40 (*N* = 194). Results showed 3.4% (*n* = 26) had knowledge of HPV (*M* = 15.5 [passing score =20]; *SD* = 3.9). White females (*n* = 15) and ages 18-23 years (*n* = 21) scored higher. 60.8%, (*n* = 118) had Pap smears. There is a need for HPV health educational programs to increase knowledge and prevent transmissions in at risk women.

*Keywords:* HPV, STI, women’s diseases, cervical cancer, HINTS survey,

A Survey of Human Papillomavirus Knowledge of University Female Students

**Introduction**

Human Papillomavirus (HPV) includes over 100 viruses which are transmitted by sexual contact that causes genital warts and cancer. There is no cure for HPV. College aged students (20-24 years) are 44.8% more likely to acquire the HPV disease than other ages (Center for Disease Control and Prevention, [CDC], 2013). It causes cancer of the cervix and of the throat (Medicine Net, 2014). 79 million people have HPV in the United States (CDC, 2014). Some types of HPV can cause tumors of the genital tract. 14 million people will become infected with HPV in the United States each year (CDC, 2014). Cervical cancer rates for Texas were 8.1-13.7 incidence rates per 100,000 (CDC, 2014).

HPV is diagnosed by a Papanicolaou test (Pap test) and an HPV test (U. S. Library of Medicine, 2014). The Pap test checks the cervix for abnormal cells that could cause cervical cancer and the HPV test checks the cervix for HPV that can cause abnormal cells, leading to cervical cancer. The genital warts caused by HPV can go away, remain, or grow in size or number (CDC, 2012). HPV is prevented by using condoms, sexual abstinence, and preventive vaccines aseCeravix (National Cancer Institute, 2014) and Gardasil (Merck & Company, 2014).

**Review of Literature**

Several investigations revealed that female HPV knowledge has increased over the years but there is need for improvement. Young college women ages 17-18 years old were 4 times more likely of not knowing about HPV (Mills, Head, & Vanderpool, 2013; Vogtmann et al., 2010). In other investigations, students 23-25 years old were more likely to have heard about HPV (Roberto, Krieger, Katz, Goei, & Jain, 2011; Vogtmann, et al.). Questions regarding symptoms and behavior of HPV infection were more likely to be incorrect in college students according to Lopez & McMahan, 2007 and Vogtmann et al. College women scored higher on questions about transmission, infection, and links to cervical cancer (Lopez & McMahan, 2007; Vogtmann et al.). Daley et al. (2010) and Teitelman, Stringer, Nguyen, Hanlon, Averbuch, & Stimpfel (2011) concluded that 2% of women have heard of HPV. In 2013, approximately 94% of women had heard of HPV (Daley et al.; Teitelman et al.). Schmidt-Grimminger, Frerichs, Blackbird, Workman, Dobberpuhl, & Galloway (2013) and Vogtmann et al. found that college aged women knew of HPV but <50% answered the questions correctly.

These investigations showed that most educated populations lack HPV knowledge. Two investigations concluded that awareness was low in women ages 9-23 years (Fazekas, Brewer, & Smith, 2008 and Tiro et al., 2007). Female college students demonstrated lower levels of HPV and cervical cancer knowledge (Hwaid, 2014; Mills et al., 2013). Hwaid and Mills found that 36.87 % of women knew that HPV causes genital warts and cervical cancer. McCusker et al. (2013) found that medical students answered < 50% of HPV questions correctly.

Different types of interventions used for HPV and STI include lecture, small group discussion, educational media, cues, skills training, and module education (Cohen, Vanderpool, & Head, 2012; Jemmott, Jemmott, Ngwane, Icard, Leary, Gueits & Brawner, 2014; Lambert, 2011; Logie, Daniel, Newman, Weaver, & Loutfy, 2014). College students in intervention programs on HPV vaccine benefits were more likely to receive the vaccine (Lambert; Patel, Zochowski, Peterman, Dempsey, Ernst, and Dalton, 2012). Grimminger, Frerichs, Black Bird, Workman, Dobberpuhl, & Watanabe-Galloway (2013) reported low HPV and HPV vaccine knowledge in a survey administered to non-white (American Indian) participants. Lambert (20ll) administered an HPV prevalence/complications survey to physician assistants where 45% answered HPV questions correctly, but 79% were answered correctly.after the educational intervention. Despite prevalence rates, college students know very little about HPV (Lambert).

The l-2-3 PAP educational program tested the efficacy of an educational DVD, skills, and motivation intervention on HPV knowledge (Cohen, Vanderpool, & Head, 2012). It did increase HPV vaccine usage. The FASY was a video-based STD educational intervention thatt increased STI knowledge among 176/200 Haitian women after a follow up survey (Logie, Daniel, Newman, Weaver, & Loutfy, 2014). Let Us Protect Our Future was a risk-reduction intervention inclusing that interactive games (Jemmott, Jemmott, Ngwane, Icard, Leary, Gueits & Brawner, 2014). It significantly decreased self-reported sexual risk behaviors in young South African adolescents

Theories and models were used in HPV knowledge studies. The Health Belief Model (HBM) (Rosenstock, 1974) proposes that people make health decisions based on how likely they believe that they can acquire the disease. According to the HBM model, if a person believes the benefits outweigh the barriers, then the individual might be more likely to get the HPV vaccination. If a person believes that they are not susceptible to the disease, then they will be less likely to acquire the vaccine. The Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Hernandez, 2011) was another theory used for increasing HPV knowledge in young college women (Fisher, Kohut, Salisbury, Salvador, 2013)

The purpose of this cross-sectional descriptive investigation was to survey HPV knowledge of female university students using the Health Information National Trends Survey (HINTS)

(National Cancer Institute, 2007). The survey may increase knowledge and aid in prevention. The study utilized the Health Belief Model theory (Hernandez, 2011; Rosenstock, 1974). The study hypothesized that female students will not have adequate knowledge of HPV and that <75% of 26 HINTS questions will be answered correctly (National Cancer Institute, 2007). The generalizability of the study was limited by the non­-randomized convenience sample. The limitations included: self-report, age, female gender, and knowledge. The delimitations were: previous HPV knowledge, previous HPV exposure, HPV vaccine knowledge, and sexually transmitted disease knowledge and testing. The assumption was that students answered the survey honestly and were not previously surveyed with HINTS or a similar survey.

**Methods**

**Instrumentation**

The valid Health Information National Trends Survey (HINTS) was administered with 26 multiple choice questions on HPV knowledge. Specific questions were on HPV knowledge, Pap test knowledge, and HPV vaccine knowledge (National Cancer Institute, 2014). HPV knowledge questions were 11 (Questions 9, 10-11, 13, 17-24). Pap test knowledge questions were 11 (Questions 1-8, 14-16). Vaccine knowledge questions were 4 (Questions 12, 23, 25-26) (National Cancer Institute, 2007).

Demographic variables included age (ranging from 18-40); Socio-Economic Status (<$10,000 to >$200,000); race (Caucasian, African American, American Indian and Alaska Native, Asian, Native Hawaiian, Hispanic, and Mixed); and University classification (Freshman, Sophomore, Junior, and Senior) (Lamar University, 2015; United States Census Bureau, 2014).

The following constructs of the Health Belief Model were assessed in the survey questions: perceived susceptibility (in questions: 2, 3, 4, 5, 6, 9, 15, 17, and 25); perceived severity (questions: 7, 10, 11, 14, 17, 19, 20, 21, 22, and 26); perceived benefits (questions: 1, 8, 16 and 23) and cues to action (questions: 12, 13, 18, and 24) (Berman, A., Snyder, B., Kozier, & Erb, G., 2007; Hernandez, 2011).

**Participants**

The study included 208 volunteer participants of which 194 surveys were used. 14 surveys were rejected because participants declined to answer some personal questions in the survey. All participants were female gender, full time university students, and ages 18-40 years. The IRB application was approved by the Lamar University Human Subjects Review Board.

**Data Collection**

Students were administered the HINTS survey of HPV knowledge in a classroom setting (NCI, 2007). The variable was each participant’s score (pass or fail) on the HINTS survey. Having knowledge (passing scores) were scores of 20-26 or 75%; not having knowledge (failing scores) were scores of 19-0 or 25%. Participants were given a hard copy of the HINTS survey and instructed to circle one answer choice for each question. The anonymous surveys were scored and results recorded on a code sheet. Demographic questions were included. Pap test, HPV knowledge, and vaccine knowledge questions were recorded. The Health Belief model (Rosenstock, 1974; Hernandez, 2011) theoretical constructs were matched to the HINTS survey questions (NCI).

**Results**

Demographic data results revealed in Table 1 were younger females ages 18-23 were the majority at 84.6% (*n* = 163*)*. For race, white females were the majority at 48.5% (*n* = 94) and African American females next at 38.1% (*n* = 74). The most reported income was <$10,000 per year, 43.3% (*n* = 84). College juniors were the majority surveyed at 38.7% (*n* = 75).

Results for pass or fail on the HINTS Survey (NCI, 2007) were analyzed with descriptive statistics using totals (frequencies) and percentages, mean, and standard deviation. The mean (*M* = 15.5) was the average score of surveys (passing score= 20), *SD* =3.9. Test scores ranged from 5-23. Student reporting inadequate knowledge of HPV were 86.6% (*n* = 168). Twenty-six (13.4%) had adequate knowledge of HPV. Twenty-one in the age group 18-23 had the greater percentage of knowledge at 10.8% passing rate (n = 163) and 9 with SES at <$ 10,000 had the greater percentage of knowledge at 4.6% pass rate (n = 84). Fifteen white women had the greater percentage of knowledge at with 7.7% passing rate (n = 94). Eleven college seniors had the greater percentage of knowledge at 5.7% passing rate (n = 55). The results show very low percentage rates for HPV knowledge in female college students and very low average scores. See Table 1.

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PLACE TABLE 1 HERE

Students answering all HPV knowledge questions correctly were 1% (*n* = 2). Students answering all Pap test knowledge questions correctly students were 1% (*n* = 2). Students answering all vaccine knowledge questions correctly were 2% (*n* = 4). See Table 2.

HBM Theory Results: 22.2% (*n* = 43) of participants answered questions correctly that related to perceived susceptibility; 2.6% (n = 5) of participants answered questions correctly questions correctly that were based on perceived severity; 29.4% (*n* =57) of participants answered questions correctly based on perceived benefits; 1% (*n* = 2) of participants answered cues to action questions correctly; 0% (*n* = 0) of participants answered questions correctly that related to perceived barriers; and 56.2% (*n* = 109) of participants answered self-efficacy questions correctly. Therefore, only self-efficacy was the theoretical construct possessed by most participants.

PLACE TABLE 2 HERE

**Discussion and Significance**

Although white women and younger women scored higher and had greater knowledge, it was a small percentage. There is a need for more educational interventions to increase female HPV knowledge since 26/194 participants (13.4%) had adequate knowledge. Although this investigation is not generalizable, the lack of HPV knowledge in the women participants is a serious health issue. There is a need to promote HPV educational interventions by community health educators and healthcare providers. The implications for health education include evidence based interventions as educational interventions, interactive games, video based interventions, universities requiring sex education workshops, and educational pamphlets.

The implications for research are: the HINTS survey could be replicated in similar studies with evidence based educational interventions. The HINTS survey could be used in longitudinal pre-and post-test studies.

The participants (women) surveyed did not have adequate knowledge of HPV (86.6%, *n* = 168). HPV and STI interventions may aid in prevention. The researcher found that younger women have greater knowledge of HPV than older women and minorities have less knowledge than other races in this investigation and these issues need addressing. HPV is a serious sexually transmitted infection and awareness and prevention methods are needed to decrease HPV rates and cancer causing complications.

References

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*.

Englewood, N. J. Prentice Hall.

Berman, A., Snyder, B., Kozier, & Erb, G. (2007). *Kozier & Erb’s fundamentals of nursing: Concepts, process, and practice*. New York, New York: Prentice Hall

Centers for Disease Control and Prevention. (2014, September 2). *Cervical cancer statistics.*  Retrieved from http://www.cdc.gov/cancer/cervical/statistics/index.htm

Centers for Disease Control and Prevention. (2011 Centers for Disease Control and Prevention.

(2011, April 14). *Genital HPV infection:*

*CDC fact sheet. Sexually transmitted diseases.* Retrieved from http://www.cdc.gov/std/hpv/

Centers for Disease Control and Prevention. (2012, July 25). *Human Papillomavirus*

*(HPV)*. Retrieved from http://www.cdc.gov/std/hpv/pap/default.htm

Centers for Disease Control and Prevention. (2013, February 5). *Human Papillomavirus*

*(HPV*). Retrieved from www.cdc.gov/hpv/whatishpv.html

Cohen, E. L., Vanderpool, R. C., & Head, K. J. (2012). *1-2-3-Pap intervention to reduce*

*cervical cancer in Appalachian Kentucky*. Retrieved from

http://comm.uky.edu/hcrc/?page=1-2-3-Pap+Intervention

Daley, E. M., Vamos, C. A., Buhi, E. R., Kolar, S. K., McDermott, R. J., Hernandez, N.,

& Fuhrmann, H. J. (2010). Influences on Human Papillomavirus vaccination

status among female college students. *Journal of Women’s Health, 19*(10), 1885-1891. doi:10.1089/jwh.2009.1861

Fazekas, K., Brewer, N., & Smith, J. (2008). HPV vaccine acceptability in a rural

southern area. *Journal of Women’s Health, 17*(4), 539-548.

Fisher, W. A., Kohut, T., Salisbury, C., & Salvadori, M. I. (2013). Understanding Human

Papillomavirus vaccination intentions: Comparative utility of the theory of reasoned action and the theory of planned behavior in vaccine target age women and men. *The Journal of Sexual Medicine*, 10(10), 2455-2464. doi:10.1111/jsm.12211

Grimminger, D. S., Frerichs, L., Blackbird, A. E., Workman, K., Dobberpuuhl, M. &.

Galloway, S. W. (2013). HPV knowledge, attitudes, and beliefs among northern

plains American Indian adolescents, parents, young adults, and health

professionals. *Journal of Cancer Education*, 28, 357-366.

Hernandez, B.L.M. (2011). *Foundation concepts of global community health promotion*

*and education*. Sudbury, MA: Jones & Bartlett

Hwaid, A. H. (2013). Knowledge and awareness of Papillomavirus and cervical cancer

among college students and health care workers women in Diyala, Iraq. *American Journal of* *Public Health Research, 8*(1), 221-225.

Jemmott, L. S., Jemmott III, J. B., Ngwane, Z., Icard, L., Leary, A. O., Gueits, L., &

Brawner, B. (2014). ‘Let us protect our future’ a culturally congruent evidenced-based HIV/STD risk reduction intervention for young South African adolescents. *Health Education Research*, 29(1), 166-181.

Lamar University. (2015). *General Academic Policies and Procedures*. Retrieved from

http://catalog.lamar.edu/general-academic-policies/index.html

Lambert, E. C. (2001). College students’ knowledge of Human Papillomavirus and

effectiveness of a brief educational intervention. *The Journal of the American*

*Board of Family Medicine*, 14(3), 178-183.

Logie, C. H., Daniel, C. A., Newman, P.A., Weaver, J., Loutfy, M. R. (2014). A psycho-

educational HIV/STI prevention intervention for internally displaced women in Leogane, Haiti: Results from a non-randomized cohort pilot study. *PLoS ONE*, 9 (2), e89836. doi:10.1371/journal.pone.0089836

Lopez, R., & McMahan, S. (2007). College women’s perception and knowledge of

Human Papillomavirus (HPV) and cervical cancer. *Californian Journal of Health*

*Promotion.* *5*(3), 12-25.

McCusker, S. M., Macqueen, I., Lough, G., MacDonald, A. I., Campbell, C., & Graham,

S. V. (2013). Gaps in detailed knowledge of Human Papillomavirus (HPV) and the HPV vaccine among medical students in Scotland. *BioMed Central Public Health, 13*, 264. doi:10.1186/1471-2458-13-264.

MedicineNet.com (2014). *Definition of Human Papillomavirus*. Retrieved from

http://www.medicinenet.com/script/main/art.asp?articlekey=3813

Merck Sharp & Dohme Corporation. (2014). *Gardasil*. Retrieved from

http://www.gardasil.com

Mills, L. A. & Head, K. J., & Vanderpool, R. C. (2013). HPV vaccination among adult

women: A perspective from Appalachian Kentucky. *Preventing Chronic Disease, 10.*  Retrieved from http://www.cdc.gov/pcd/issues/2013/pdf/12\_0183.pdf

National Cancer Institute. (2007). *Hints questions*. Retrieved from

http://hints.cancer.gov/topic.aspx?section=Cervical+Cancer

National Cancer Institute. (2014). *Pap and HPV testing*. Retrieved from

http://www.cancer.gov/cancertopics/factsheet/detection/Pap-HPV-testing

Roberto, A. J., Krieger, J. L., Katz, M. L., Goei, R., & Jain, P. (2011). Predicting

pediatricians communication with parents about the Human Papillomavirus (HPV) vaccine: An application of the theory of reasoned action. *Health Communication,* 26, 303-312.

Rosenstock, I. (1974). Historical origins of the Health Belief Model. *Health Education*

*Monographs.*Vol. 2 No. 4.

Schmidt-Grimminger, D., Frerichs, L., Blackbird, A. E., Workman, K., Dobberpuuhl, M. &. Galloway, S. W. (2013). HPV knowledge, attitudes, and beliefs among northern plains American Indian adolescents, parents, young adults, and health

professionals. *Journal of Cancer* *Education,* *28*, 357-366.

Schmidt-Grimminger, D., Frerichs, L., Blackbird, A. E., Workman, K., Dobberpuuhl, M. &.

Galloway, S. W. (2013). HPV knowledge, attitudes, and beliefs among northern plains

American Indian adolescents, parents, young adults, and health

professionals. *Journal of Cancer* *Education,* *28*, 357-366.

Teitelman, A. M., Stringer, M., Nguyen, G. T., Hanlon, A. L., Averbuch, T., & Stimpfel,

A. W. (2011). Social cognitive and clinical factors associated with HPV vaccine initiation

among urban, economically disadvantaged women. *Journal of Obstetric,* *Gynecological*

*& Neonatal Nursing, 3*(40), 691-701.

Texas Department of State and Health Services. (2014, September 10). *Human* *Papillomavirus*

*(HPV).* Retrieved from http://www.dshs.state.tx.us/hivstd/info/hpv/default.shtm

United States Census Bureau. (2014, February 24). *Income main*. Retrieved from

http://www.census.gov/hhes/www/income/

United States National Library of Medicine. (2015, February 12). *Pap smear*. Retrieved

from www.nlm.nih.gov/medlineplus/ency/article/003911.htm

Vogtmann, E., Harlow, S. D., Valdez, A. C., Valdez, J. C. C., & Ponce, E. L. (2010).

HPV knowledge in Mexican college students: Implications for intervention.

*Health & Social* *Care in the* *Community,* *19*(2), 148-157. doi:10.1111/j.1365-

2524.2010.00954.x

Warren, K. (2009). HPV knowledge among female college students and the short term

effectiveness of HPV education. *The Internet Journal of Academic Physician Assistants*, 7(2), 1-9.