Problem
- The human papillomavirus (HPV) causes 66% of cervical cancers, with disproportionately incidence among Hispanic, African-American(AA), and American Indian/Alaskan Native women (Danne, Markowitz, Saraya et al., 2014).
- 12,200 women are diagnosed with cervical cancer every year (Brinton et al., 2011), and in 2010, 2,121 women per 100,000 died from the disease (US Department of Health and Human Services [DHHS], 2004).
- HPV 6, 11, 16, and 18 are the four most commonly transmitted strains. HPV 16 and 18 confer particularly high risk for cervical cancer (Dunne et al., 2009).
- In the United States, the estimated prevalence in 18% among girls aged 14-19, 45% among women aged 20-24, 27% among women aged 25-29, and 15% among men collectively (Brinton et al., 2010; Torr, Cunkey, & Raskas, 2013).
- Non-Hispanic AA adolescent girls (55.9%) had a higher prevalence of HPV compared to non-Hispanic White girls (15.9%) and Mexican-American girls (14%) (Portan et al., 2009).
- The three-dose HPV vaccine, Gardasil, is recommended to both adolescent girls and boys and protects against the four most common strains. However, less than 50% of girls are vaccinated (Shlofmy et al., 2014).
- While the rate of initiating the vaccination increased from 25.1% in 57.1%, only 37.5% of adolescent girls complete the series.
- Black and Hispanic girls are less likely to initiate the vaccine at the same rate as non-Hispanic White girls but are less likely to complete the series (Kramer & Dunphy, 2012).
- All three doses must be received for vaccine efficacy. Papillomavirus-associated (Pap smear) abnormalities in HPV 16 by 92% and HPV 18 by 97% (Shahno et al., 2010).
- Lack of parents’ knowledge about HPV and fears about vaccine safety and efficacy are some of the factors that contribute to parents’ refusal to have their daughters vaccinated (Shlofmy et al., 2014).
- The purpose of this study was to examine the associations between intentions to vaccinate for HPV and HPV knowledge among parents with daughters.

Materials and Methods
- Retrospective cross-sectional data from the 2006-2007 Health Information National Trends Survey (HINTS) were used (ICPSR, 2007).
- Data were weighted using “svyset” command to obtain linearized standard errors “robustness.”
- Participants who responded to survey items capturing HPV knowledge and intentions to vaccinate their daughters for HPV were retained for all analysis.
- Main outcome measure (Intentions to Vaccinate Daughters Against HPV):
  - Categorical variable coded as “0” (no), “1” (not sure/depends), and “2” (yes).
- Exposure variable (HPV Knowledge):
  - Dichotomous variable coded as “0” (no [not knowledgeable]) and “1” (yes [knowledgeable]).
- Descriptive, bivariate, and multivariate multinominal logistic regression models were estimated.
- Forward stepwise followed by manual variable selection method were used to identify covariates to control for in the final model.
- Covariates adjusted in the final model include:
  - Gender, age, race/ethnicity, education, income, employment, and insurance.
- Relative Risk Ratios (RRRs) and 95% confidence intervals (CIs), statistical significance set at a two-tailed p value of < .05. SPSS Version 22 and Stata/SE version 13.1 were used for all analysis (IBM Corp., 2013; StataCorp., 2013).
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Results
- Extensiveness of intentions to vaccinate daughters, (57.9%), were not sure/depends (22.7%), and had intentions (59.3%) among parents who were knowledgeable.
- Parents who were knowledgeable about HPV, 14.02% (n = 164), 17.52% (n = 208), and 55.96% (n = 544) indicated that they did not, were not sure/depends, or had intentions to vaccinate their daughters respectively, (1.61, 78.68) = 10.66, p = 0.002.

Conclusions
- Overall, most parents were knowledgeable about HPV with over half (59.3%) of them having intentions to vaccinate daughters.
- However, parental intentions to vaccinate seems to have influence on daughters vaccination. Women who were HPV knowledgeable were not sure or did not have intentions to vaccinate their daughters (33.5%).
- However, being HPV knowledgeable point to be strongly associated with intentions to vaccinate daughters.
- Limitations
  - At the time that the HINTS 2007 data was collected, the HPV vaccine had just recently been approved and may have had an effects on participants’ responses to the main outcomes. However, while this may have an influence on participants’ responses, the majority of them were knowledgeable about HPV.
  - The cross-sectional nature of the HINTS 2006-2007 data could not allow for causal inference between the outcomes and predictor variables.
- Healthcare providers should assess what parents know about HPV before counseling their patients to identify knowledge deficits and address knowledge gaps.

Literature Cited
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Table 2 & 3: Unadjusted and adjusted multivariable multinominal logistic regression analysis of the association between HPV knowledge and intentions to vaccinate daughters, Health Information National Trends Survey (HINTS) 2007-2009

Figure 2. and 5: Percentage of HPV knowledge, gender and race/ethnicity, Health Information National Trends Survey (HINTS) 2007-2009

Figure 3. Extensiveness of intentions to vaccinate daughter (no, not sure/depends and yes) among parents who were knowledgeable, Health Information National Trends Survey (HINTS) 2007-2009

Figure 4. Extensiveness of intentions to vaccinate daughter (no, not sure/depends and yes) among parents who were knowledgeable, Health Information National Trends Survey (HINTS) 2007-2009

Figure 6. Extensiveness of intentions to vaccinate daughter (no, not sure/depends and yes) among parents who were knowledgeable, Health Information National Trends Survey (HINTS) 2007-2009