



Level of Knowledge about Human Papillomavirus Infection among Women of Kashan City, Iran

ARTICLE INFO

Article Type

Descriptive Study

Authors

Nekooi M.S.¹ BSc
Ayazi Sh.¹ BSc,
Gandomi M.² BSc,
Moosavi S.Gh.³ MSc,
Fakhri A.* PhD

How to cite this article

Nekooi M.S, Ayazi Sh, Gandomi M, Moosavi S.Gh, Fakhri A. Level of Knowledge about Human Papillomavirus Infection among Women of Kashan City, Iran. International Archives of Health Sciences. 2016;3(1):7-12.

*"Social Determinants of Health (SDH) Research Center" and "Environmental Health Department, Health Faculty", Kashan University of Medical Sciences, Kashan, Iran
¹Public Health Department, Public Health School, Kashan University of Medical Sciences, Kashan, Iran
²District Health Center of Aran and Bidgol, Kashan University of Medical Sciences, Aran & Bidgol, Iran
³Statistics & Epidemiology Department, Public Health School, Kashan University of Medical Sciences, Kashan, Iran

Correspondence

Address: Department of Public Health and Statistics, School of Public Health, 5th km Ravand Road, Kashan, Iran
Phone: +983155540021
Fax: +983155540111
fakhri-a@kaums.ac.ir

Article History

Received: November 5, 2015
Accepted: February 15, 2016
ePublished: March 10, 2016

ABSTRACT

Aims A few studies concentrate on the level of knowledge of HPV. This study was conducted to evaluate the level of knowledge about HPV, its risk factors, and its relation with cervical cancer in women of Kashan City, Iran.

Instrument & Methods This descriptive cross-sectional study was conducted in January 2015 in the population of the women of Kashan City, Iran, and 200 persons were selected by simple sampling method. The level of knowledge about HPV and cervical cancer were measured using a questionnaire with 10 questions about knowledge. The data was analyzed in SPSS 16 software by Chi-square, Exact Fisher and Kruskal-Wallis tests.

Findings Most of the participants (152 persons; 76%) had "weak, 26 participants (13%) had "moderate" and only 22 participants (11%) had "strong" level of knowledge about HPV. There were significant differences between the level of knowledge according to educational level ($p=0.014$) and professional status ($p<0.001$) but there were no differences according to marital status ($p=0.9$) and age ($p>0.05$). In all the questions, the most frequent answer was "don't know". The participants had some knowledge about "HPV causing cervical cancer" (34.5%), "HPV causing genital warts" (38%), "sexually transmission of HPV" (37.5%) and "increased risk of getting HPV by extramarital sexual affairs" (43.5%)

Conclusion The level of knowledge about HPV, genital warts, and ways of infection transmission and its preventions in women of Kashan City, Iran, is insufficient.

Keywords Human Papilloma Virus; Knowledge; Uterine Cervical Neoplasms

CITATION LINKS

[1] Classification of ... [2] Epidemiologic classification of human papillomavirus types associated with ... [3] Viruses associated with human ... [4] Cervical cancer: Screening and ... [5] Human papillomavirus infections and risks of ... [6] Acceptance of human papillomavirus vaccination ... [7] Human Papillomavirus awareness, knowledge and ... [8] Awareness, knowledge, and beliefs about human papillomavirus in ... [9] Priority setting for improvement of cervical cancer ... [10] Epidemiology of cervical cancer and human papilloma virus ... [11] Human papillomavirus prevalence and types among iranian women ... [12] The prevalence of human papillomavirus in cervical ... [13] Studying the use of health belief model in ... [14] Studying prevalence of HPV infection in malignant lesions of ... [15] Studying awareness and health behaviors of ... [16] Knowledge differences between male and female university ... [17] Women's attitudes on human papillomavirus vaccination to ... [18] Human papillomavirus infection and ... [19] Awareness of human papillomavirus and factors ... [20] HPV vaccine acceptance in male ... [21] Engaging parents and schools improves uptake of the human ... [22] Adults' knowledge and behaviors related to human ... [23] Challenges, lessons learned and results following the ... [24] Public awareness that HPV is a risk factor for ... [25] Knowledge and awareness of papillomavirus and ... [26] University students' knowledge and ... [27] Knowledge about infection with human ... [28] Community awareness of hpv screening and vaccination in ... [29] Barriers to prevention: knowledge of HPV, cervical cancer, and HPV vaccinations among African American ... [30] Knowledge and awareness of female sex workers (FSWs) about human papillomavirus (HPV) infection in ... [31] Awareness of human papillomavirus among women ... [32] HPV Awareness in higher-risk young women: the need for ... [33] Sex differences among college students in awareness of the human papillomavirus vaccine ... [34] Chang LC, et al. Factors associated with HPV awareness among mothers of ... [35] HPV vaccine awareness and knowledge among women living ... [36] College women's perception and knowledge of ... [37] Association between human papillomavirus vaccine ... [38] Beliefs about cervical ... [39] Improving adolescent health: Focus on ... [40] The HPV vaccine and behavioral ... [41] Predictors of HPV vaccine acceptability: A theory-informed ... [42] Information channels associated with awareness of human papillomavirus infections ...

Introduction

More than 80 types of Human Papillomavirus (HPV) have been discovered that about 40 types infect the genitalia [1]. Some HPV types should be considered as high risk carcinogenic types [2]; e.g. types 16, 18 and 31, which have the main role in developing the cervical cancer [3]. In fact, all cervical cancers are developed by high risk HPVs [4]. This infection is common among sexually active people, especially those who are at the age of 18-24 [5]. In the United States, HPV is estimated as 4.6million cases in this age group in both genders. However, spreading the infection has been reported 30-82% among young girls [6]. About 70-80% of sexually active women will be infected by HPV in their lifetimes [7]. The most important risk factors for this infection are experience of first sexual intercourse at an early age, history of any sexual transmitted disease (STD), and multiple sexual partners [8]. Cervical cancers have low incidence in Muslim countries due to cultural and religious considerations, but because of no organized cervical screening in these countries, cervical cancers are usually diagnosed in advanced stages with poor prognosis [9]. The prevalence of HPV infection is 76% in cervical cancer patients and 7% among healthy Iranian women [10] that is low in general, but the same as other areas in the world in cervical cancer cases [4, 11]. An Iranian study shows that prevalence of types 16, 18 and 23 HPVs in cervical cancer patients is about 85.5% [12].

Cervical cancers due to HPVs are the second common disease after breast cancer in 15-44 year old women [7, 13, 14]. Pap smear is a screening test to diagnose cervical cancer in early stages in seemingly healthy women [13]. Health education system tries to introduce health behaviors, such as Pap smear test, to prevent various kinds of STDs and raising the level of awareness about the importance of Pap smear test in order to make an early diagnosis [8, 15]. It also seems that primary prevention by vaccination is hopeful to preclude cervical cancer [16]. In 2006, HPV vaccine was approved for 9-26 year old girls and women by United States Food & Drug Association [6]. Several studies reflect that HPV vaccine is safe and reduces the probability of cervical cancer nearly 70%, but the reason for refusing it by young girls' parents is concern about encouraging young girls to have unsafe

sexual behaviors in addition to its complications [17-21].

Several studies have indicated that despite the high prevalence of HPV, even among informed people, there are false perceptions towards HPV. There is a misunderstanding between genital warts and genital herpes, relationship between HPV and cervical cancer, and purpose of Pap smear test [7]. Despite of catastrophic consequences of HPV, most women are not aware about it and had never heard of the HPV name; those that hear mostly do not know HPV as a reason of cervical cancer [22-25], and men and women have weak awareness of HPV relationship with cervical cancer before and after vaccination [16].

A few studies concentrate on the level of knowledge of HPV. Thus, finding out the level of awareness and attitudes of young men and women about this issue is extremely critical. This study was conducted to evaluate the level of knowledge about HPV, its risk factors, and its relation with cervical cancer in women of Kashan City, Iran.

Instrument & Methods

This descriptive cross-sectional study was conducted in January 2015 in students of Kashan University of Medical Sciences and employees and clients of 2 Health Centers in Kashan City, Iran, and 200 persons were selected by simple sampling method. The sample size was small due to limited time and resources; the sampling was continued until reaching 200 filled questionnaires.

The level of knowledge about HPV and cervical cancer were measured using a questionnaire in 3 parts; demographic features (age, marital status, educational level and professional status), 10 questions related to the knowledge about HPV and cervical cancer, and one question about sources of participants' information related to this infection. Assessment of knowledge was based on 3-item answers; "yes", "no", "don't know". The levels of knowledge were rated as "strong" (80-100%), "moderate" (60-79%), and "weak" (less than 60%) [25]. Reliability and validity of the questionnaire was confirmed by other studies [25]. Nevertheless, the validity was also confirmed by the opinion of experts according to cultural conditions of the

research. The reliability was calculated as 0.88 by Cronbach's alpha method.

The data was analyzed in SPSS 16 software by Chi-square (to compare age, marital status and knowledge level about HPV), Exact Fisher (to compare educational level and knowledge level) and Kruskal-Wallis (to compare professional status and knowledge) tests.

Findings

Most of the participants (152 persons; 76%) had "weak, 26 participants (13%) had "moderate" and only 22 participants (11%) had "strong" level of knowledge about HPV.

There were significant differences between the level of knowledge according to educational level ($p=0.014$) and professional status ($p<0.001$) but there were no differences according to marital status ($p=0.9$) and age ($p>0.05$). Almost all housewives (98.1%) and below diploma (84%)

participants had "weak" level of knowledge about HPV (Figure 1). The mean score of employees (4.02 ± 3.06), students (3.33 ± 3.11) and housewives (1.13 ± 1.67) had significant difference ($p<0.001$).

In all the questions, the most frequent answer was "don't know". The participants had some knowledge about "HPV causing cervical cancer" (34.5%), "HPV causing genital warts" (38%), "sexually transmission of HPV" (37.5%) and "increased risk of getting HPV by extramarital sexual affairs" (43.5%; Figure 2). 77 participants had heard the HPV name from various sources; 23.5% through course books, 11% through staffs, 9.5% through other sources, 7.5 % through non-course books and magazine, 5.5% through family and friends, 3% through media, 3% through internet and 11% through satellite. The difference of awareness based on university course books ($p<0.001$) and internet ($p<0.001$) were significant.

Figure 1) Frequency of different levels of knowledge among participants according to their demographic parameters (Numbers in parentheses are percent)

Parameters	Weak	Moderate	Strong	p Value
Marital status				
Single (n=92)	69 (75)	13 (14.1)	10 (10.9)	0.9
Married (n=108)	83 (76.9)	13 (12)	12 (11.1)	
Age				
25 and less (n=102)	80 (78.4)	13 (12.7)	9 (8.8)	0.58
More than 25 (n=98)	72 (73.5)	13 (13.3)	13 (13.3)	
Educational level				
Below Diploma (n=25)	21 (84)	2 (8)	2 (8)	0.014
Diploma & Associate degree (n=73)	63 (86.3)	8 (11)	2 (2.7)	
BSc & higher (n=102)	68 (66.7)	16 (15.7)	18 (17.6)	
Professional Status				
Employee (n=51)	33 (64.7)	9 (17.6)	9 (17.6)	0.001
Student (n=97)	68 (70.1)	16 (16.5)	13 (13.4)	
Housewife (n=52)	51 (98.1)	1 (1.9)	0	

Figure 2) Frequencies and percentages of the answers to 10 knowledge questions (Numbers in parentheses are percent)

Questions	Yes	No	Don't know
1- Have you heard about HPV before?	77 (38.5)	123 (61.5)	-
2- Does HPV cause stomach cancer?	9 (4.5)	71 (35.5)	120 (60)
3- Does HPV cause cervical cancer?	69 (34.5)	18 (9)	113 (56.5)
4- Does HPV cause genital warts?	76 (38)	13 (6.5)	111 (55.5)
5- Can viruses cause warts on hand cause genital warts?	26 (13)	54 (27)	120 (60)
6- Can HPV be sexually transmitted?	75 (37.5)	14 (7)	111 (55.5)
7- Is HPV transmitted by sharing food or utensils?	11 (5.5)	77 (38.5)	112 (56)
8- Do extramarital affairs increase the risk of getting HPV?	87 (43.5)	11 (5.5)	102 (51)
9- Does smoking increase the probability of getting this disease?	30 (15)	49 (24.5)	121 (60.5)
10- Is the vaccine for the prevention of the disease available?	28 (14)	37 (18.5)	135 (67.5)

Discussion

The findings offered that the level of knowledge about HPV is worrying. Our society is not aware of ways of transmitting this disease and its important consequences, like cervical cancer, which shows weak performance of health system about STDs and their factors. Overall, the knowledge of the public about HPV infection is poor [26, 27] so health system should give enough and correct information on HPV infection to the public [27]. Age, sex, sexual activity, income, and education have been discussed as the related variables to knowledge level [28-35]. Only 38.5% of our participants claimed they had already heard of HPV, while the knowledge level of 76% of participants was assessed weak and only 11% of them had strong level of knowledge. The similar results concerning the difference between this claim and reality are seen in Lopez & McMahan at South California's University that only 20.5% of participants had strong knowledge level, while 78.5% had claimed that they know about HPV [36]. In Iraq, a developing country in our region, 53.5% of participants had already heard of HPV [25].

Single and married women were the same as each other in terms of strong level of knowledge. On the contrary, Holcomb *et al.* have reported the knowledge of married women overwhelmingly higher than singles [22]. A study, which has been carried out in London, has also revealed that the knowledge of older women was more than younger women [31]. However, in our study, these two groups had not significant difference in level of knowledge. It is maybe due to the failure of health system in notifying the public about this infection.

Our study showed significant difference between high and low educational level. According to Holcomb *et al.* findings, knowledge of HPV, cervical cancer, genital warts, and infection transmission among medical staff shows a statistically significant difference in comparison to students ($p < 0.001$). Also, the knowledge level between two groups of health staff and housewives and medical students and housewives, were statistically significant [22]. Knowledge level of students and employees was more than housewives ($p < 0.001$) in our study. This is supported by a systematic review that

illustrated health professionals had better knowledge about HPV than other participants [27].

The levels of knowledge for most questions were weak and only the knowledge of high risk of HPV in extramarital sexual affairs was moderate. The lowest level of knowledge was concerning the availability of the vaccine for the prevention of the disease. Efforts will be needed to ensure that unvaccinated women know the importance of Pap smear test when they reach the age that screening begins [37]. Contextual inequalities in vaccine coverage need to be explored further. It is necessary to assess the effectiveness of vaccine considering its challenges [38-41].

The difference between level of knowledge based on course books and internet data was significant in the respect that may be those who had a strong level of knowledge obtained this through university's course books and searching these information in internet. In Lopez & McMahan, 55.6% of participants have taken their knowledge through Medias, 37.2% through course books, 29.1% through relatives, 20.9% through medical staffs, 17.4% through magazines and newspapers and 16.3% through internet had attained information [36]. It can be inferred that using radio and TV for informing must be more due to different cultures of our population. Although TV is an appropriate way of exchanging this information, opportunities for education by providers should not be missed [42]. Health training must cover not only community but also medical staffs, and this plan should be considered contextually for target groups of ages from different socio-economical classes.

Our study limitations were small and non-randomized sample that cause insufficient generalizability of the results. We did not pay attention to the influencing factors on the awareness of HPV for example contextual factors. Moreover, because the knowledge of students is from their books studied at universities, the absence of contextually enhancing other sources of information in order to promote women's level of knowledge and to plan training programs in today's society is tangible. We suggest other researchers to investigate the community knowledge and attitude specifically toward HPV vaccine.

Conclusion

The level of knowledge about HPV, genital warts, and ways of infection transmission and its preventions in women of Kashan City, Iran, is insufficient.

Acknowledgements: The authors would like to appreciate Department of Public Health, Kashan University of Medical Sciences.

Ethical Permission: None declared by authors.

Conflicts of Interests: None declared by authors.

Funding/Support: None declared by authors.

References

- 1- de Villiers EM, Fauquet C, Broker TR, Bernard HU, zur Hausen H. Classification of papillomaviruses. *Virology*. 2004;324(1):17-27.
- 2- Muñoz N1, Bosch FX, de Sanjosé S, Herrero R, Castellsagué X, Shah KV, et al. Epidemiologic classification of human papillomavirus types associated with cervical cancer. *N Engl J Med*. 2003;348(6):518-27.
- 3- McLaughlin-Drubin ME, Munger K. Viruses associated with human cancer. *Biochim Biophys Acta*. 2008;1782(3):127-50.
- 4- Behtash N, Mehrdad N. Cervical cancer: Screening and prevention. *Asian Pacific J Cancer Prev*. 2006;7:683-86.
- 5- Pitts M, Clarke T. Human papillomavirus infections and risks of cervical cancer: What do women know?. *Health Educ Res*. 2002;17(6):706-14.
- 6- Constantine NA, Jerman P. Acceptance of human papillomavirus vaccination among Californian parents of daughters: A representative statewide analysis. *J Adolesc Health*. 2007;40(2):108-15.
- 7- Blodt S, Holmberg C, Muller-Nordhorn J, Rieckmann N. Human Papillomavirus awareness, knowledge and vaccine acceptance: A survey among 18-25 year old male and female vocational school students in Berlin, Germany. *J Public Health*. 2011;22(6):808-13.
- 8- Gerend MA, Magloire ZF. Awareness, knowledge, and beliefs about human papillomavirus in a racially diverse sample of young adults. *J Adolesc Health*. 2008;42(3):237-42.
- 9- Majidi A, Ghiasvand R, Hadji M, Nahvijou A, Mousavi A, Pakgozar M, et al. Priority setting for improvement of cervical cancer prevention in Iran. *Int J Health Policy Manag*. 2016;5(4):225-32.
- 10- Khorasanizadeh F, Hassanloo J, Khaksar N, Mohammad-Taheri S, Marzaban M, Rashidi BH, et al. Epidemiology of cervical cancer and human papilloma virus infection among Iranian women — Analyses of national data and systematic review of the literature. *Gynecol Oncol*. 2013;128(2):277-81.
- 11- Shafaghi B, Jarollahi A, Yousefzadeh B, Ameri A, Moghadam S, Mostafavi M. Human papillomavirus prevalence and types among Iranian women attending regular gynecological visits. *J Reports Radiother Oncol*. 2013;1(2):73-9.
- 12- Mortazavi SH, Zali MR, Raoufi M, Nadji M, Kowsarian P, Nowroozi A. The prevalence of human papillomavirus in cervical cancer in Iran. *Asian Pacific J Cancer Prev*. 2002;3:69-72.
- 13- Morovvatisharifabad MA, Noroozi S, Laieghi T, Noroozi A. Studying the use of health belief model in planning to do screening cervical cancer in women aged 20-65 Lordegan city, Chaharmahale Bakhtiari. *Res Q Yazd Fac Health*. 2012;12(1):98-106. [Persian]
- 14- Keihani E, Kohannia N, Izadimood N, Keikhai MR, Najmabadi H. Studying prevalence of HPV infection in malignant lesions of cervix by PCR multiplex. *J Med Sch Tehran Univ Med Sci*. 2007;64(3):95-101. [Persian]
- 15- Bakhtiari A, Hajian K. Studying awareness and health behaviors of married women concerning sexually transmitted disease and its preventions. *Res J Mazandaran Univ Med Sci*. 2005;14(42):90-8. [Persian]
- 16- Medeiros R, Ramada D. Knowledge differences between male and female university students about human papillomavirus (HPV) and cervical cancer: Implications for health strategies and vaccination. *Vaccine*. 2010;29(2):153-60.
- 17- Chan SS, Cheung TH, Lo WK, Chung TK. Women's attitudes on human papillomavirus vaccination to their daughters. *J Adolesc Health*. 2007;41(2):204-7.
- 18- Yu Y, Xu M, Sun J, Li R, Li M, Wang J, et al. Human papillomavirus infection and vaccination: awareness and knowledge of hpv and acceptability of hpv vaccine among mothers of teenage daughters in Weihai, Shandong, China. *PLOS One*. 2016;11(1):e0146741.
- 19- Kim HW. Awareness of human papillomavirus and factors associated with intention to obtain HPV vaccination among Korean youth: quasi experimental study. *Bio Med Central*. 2015;15:4.
- 20- Prue G, Santin O. HPV vaccine acceptance in male adolescents. *Psycho Oncol*. 2015;24(10):1327-9.
- 21- Whelana NW, Steenbeeka A, Martin-Misenera R, Scottb J, Smithb B, D'Angelo-Scott H. Engaging parents and schools improves uptake of the human papillomavirus (HPV) vaccine: Examining the role of the public health nurse. *Vaccine*. 2014;32(36):4665-71.
- 22- Holcomb B, Bailey JM, Crawford K, Ruffin MT. Adults' knowledge and behaviors related to human papillomavirus infection. *J Am Board Fam Pract*. 2004;17(1):26-31.
- 23- Watson M, Shaw D, Molchanoff L, McInnes C. Challenges, lessons learned and results following the implementation of a human papilloma virus school vaccination program in South Australia. *Aust N Z J Public Health*. 2009;33(4):366-70.
- 24- Marlow LA, Waller J, Wardle J. Public awareness that HPV is a risk factor for cervical cancer. *Br J Cancer*. 2007;97(5):691-4.
- 25- Hwaid AH. Knowledge and awareness of papillomavirus and cervical cancer among college students and health care workers women in Diyala, Iraq. *Am J Public Health Res*. 2013;1(8):221-5.
- 26- Yacobi E, Tennant C, Ferrante J, Pal N, Roetzheim R. University students' knowledge and awareness of HPV. *Prev Med*. 1999;28(6):535-41.
- 27- Klug SJ, Hukelmann M, Blettner M. Knowledge about infection with human papillomavirus: A systematic review. *Prev Med*. 2008;46(2):87-98.
- 28- Khanna N, Ramaseshan A, Arnold S, Panigrahi K, Macek MD, Padhi BK, et al. Community awareness of hpv screening and vaccination in Odisha. *Obstet Gynecol Int*. 2015;2015:694560.

- 29- Strohl AE, Mendoza G, Ghant MS, Cameron KA, Simon MA, Schink JC, et al. Barriers to prevention: knowledge of HPV, cervical cancer, and HPV vaccinations among African American women. *Am J Obstet Gynecol.* 2015;212(1):65.e1-5.
- 30- Ersan G, Köse S, Güneş H, Özkan M. Knowledge and awareness of female sex workers (FSWs) about human papillomavirus (HPV) infection in Turkey. *Cent Eur J Public Health.* 2012;20(3):219-22.
- 31- Waller J, McCaffery K, Forrest S, Szarewski A, Cadman L, Wardle J. Awareness of human papillomavirus among women attending a well woman clinic. *Sex Transm Infect.* 2003;79(4):320-2.
- 32- Ahken S, Fleming N, Dumont T, Black A. HPV Awareness in higher-risk young women: the need for a targeted hpv catch-up vaccination program. *J Obstet Gynaecol Can.* 2015;37(2):122-8.
- 33- Beshers SC, Murphy JM, Fix BV, Mahoney MC. Sex differences among college students in awareness of the human papillomavirus vaccine and vaccine options. *J Am Coll Health.* 2015;63(2):144-7.
- 34- Glenn BA, Tsui J, Singhal R, Sanchez L, Nonzee LJ, Chang LC, et al. Factors associated with HPV awareness among mothers of low-income ethnic minority adolescent girls in Los Angeles. *Vaccine.* 2015;33(2):289-93.
- 35- Wigfall LT, Bynum SA, Brandt HM, Hébert JR. HPV vaccine awareness and knowledge among women living with HIV. *J Cancer Educ.* 2016;31(1):187-90.
- 36- Lopez R, McMahan S. College women's perception and knowledge of human papillomavirus (hpv) and cervical cancer. *J Health Promot.* 2007;5(3):12-25.
- 37- Bowyer HL, Dodd RH, Marlow LAV, Waller J. Association between human papillomavirus vaccine status and other cervical cancer risk factors. *Vaccine.* 2014;32(34):4310-6.
- 38- Lee PW, Kwan TT, Tam KF, Chan KK, Young PM, Lo SS, et al. Beliefs about cervical cancer and human papillomavirus (HPV) and acceptability of HPV vaccination among Chinese women in Hong Kong. *Prev Med.* 2007;45(2-3):130-4.
- 39- Zimet GD. Improving adolescent health: Focus on HPV vaccine acceptance. *J Adolesc Health.* 2005;37(Suppl 6):S17-23.
- 40- Kapoor S. The HPV vaccine and behavioral disinhibition. *J Adolesc Health.* 2008;42(1):105-7.
- 41- Brewer NT, Fazekas KI. Predictors of HPV vaccine acceptability: A theory-informed, systematic review. *Prev Med.* 2007;45(2-3):107-14.
- 42- Mueller NT, Noone AM, Luta G, Wallington SF, Huerta EE, Mandelblatt JS, et al. Information channels associated with awareness of human papillomavirus infections and vaccination among Latino immigrants from safety net clinics. *J Immigr Minor Health.* 2012;14(1):183-8.