



Factors related to hysterectomy in women with physical and mobility disabilities

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ABSTRACT

This paper aims to identify self-report data for hysterectomy prevalence and to explore its correlated factors among women with physical and mobility disabilities in Taiwan. This paper was part of a larger study, “Survey on Preventive Health Utilizations of People with Physical and Mobility Disability in Taiwan”, which is a cross-sectional survey conducted in 2009. We recruited 502 women aged ≥ 15 years who were officially registered as having physical and mobility disabilities. The results show that 11.3% of women with physical and mobility disabilities accepted hysterectomy surgery and that hysterectomy prevalence was increasing by age: 7% (45–49 years), 9.7% (50–54 years), 26.3% (55–59 years), 31% (60–64 years) and 17.6% (≥ 65 years). Multilevel logistic regression analyses revealed that being ≥ 50 years or older (OR = 4.65, 95% CI = 1.79–12.064), having had cervical cancer (OR = 17.2, 95% CI = 3.5–84.47) and not having a Pap smear test within the last 3 years (OR = 2.79, 95% CI = 1.194–6.561) were more likely to accept a hysterectomy operation than their counterparts. This study suggests that future studies should analyze hospital data and assesses long-term changes to understand an area’s hysterectomy profile and correlated factors for these types of vulnerable populations.

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1. Introduction

Hysterectomy is a surgical procedure to remove the uterine body (i.e., partial hysterectomy) or the uterine body and cervix (i.e., total hysterectomy) (National Cancer Institute, 2010). Hysterectomies are the second most common type of major surgery performed on women of childbearing age. Hysterectomy may be conducted to treat many conditions that affect the uterus, such as uterine fibroids, endometriosis, pelvic support problems, abnormal uterine bleeding, cancer and chronic pelvic pain (The American College of Obstetricians and Gynecologists, 2010).

Hysterectomy prevalence rates have varied in different studies (Borman, McKenna, & Findlay, 1986; Bower, Schreiner, Sternfeld, & Lewis, 2009; Centers for Disease Control, 1992; Dicker et al., 1982; Palmer, Rao, Adams-Campbell, & Rosenberg, 1999; Pokras & Hufnagel, 1988; Zhang et al., 2005), and hysterectomy prevalence may correlate with healthcare provider

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variables and a number of clinical or non-clinical characteristics of women, such as age, race, disease condition, socioeconomic status, geographic diversity (Bower et al., 2009; Boyd, Novetsky, & Curtin, 2010; Kjerulff, Guzinski, et al., 1993; Kjerulff, Langenberg, & Guzinkis, 1993; Palmer et al., 1999; Rogo-Gupta et al., 2010; Santow & Bracher, 1992; Zhang et al., 2005).

Hysterectomy causes many physical, emotional and sexual side effects for women, and the surgery carries a great medical care cost in terms of risk of complications and productivity loss, and it also diminishes quality of life during the recovery period (The American College of Obstetricians and Gynecologists, 2010). Many women with disabilities are underserved or vulnerable in many disadvantaged circumstances (Hughes, 2006), and they often experience a number of barriers in receiving reproductive health services from their healthcare system (Friedman & Sheppard, 2007; Lin, Chen, Lin, & Sung, 2011; Lin et al., 2010; Lin, Lin, Chu, & Lin, 2011; Lin, Lin, Hsu, et al., 2011; Yen et al., 2011). Oman, Reed, and Ferrara (1999) found that incident physical disability was correlated with prevalent chronic illnesses, poor vision, obesity, physical inactivity, poor memory, fewer social activities and higher depression scores. Many studies have also reported that women with physical disabilities may use preventive health measures less than women without disabilities (Becker, Stuijbergen, & Tinkle, 1997; Cheng et al., 2001; Kroll, Jones, Kehn, & Neri, 2006). Consequently, these women may risk serious reproductive health problems such as cervical cancer. The present paper aims to collect self-report data about hysterectomy prevalence and to explore its correlated factors among women with physical and mobility disabilities in Taiwan.

2. Methods

According to Article 3 of the *Physically and Mentally Disabled Citizens Protection Act (1980)* of Taiwan, disabled people are considered individuals whose abilities to participate in society and engage in productive activities are restricted or who cannot adequately serve social roles due to physical or mental limitations. After an assessment process, disabled individuals enroll in a national disability registry system that is regulated by the government agency in charge of health and social welfare. Physical and mobility disability is one of sixteen types of disabilities in this Act, and individuals with physical and mobility disabilities include upper and lower limbs, spinal cord impairments and other nervous system impairments.

The present paper was part of a larger study “Survey on Preventive Health Utilizations of People with Physical and Mobility Disability in Taiwan”, which is a cross-sectional survey conducted in 2009. A structured questionnaire was mailed to women aged ≥ 15 years who were also officially registered as having physical and mobility disabilities in Taipei County, Taiwan. The survey included questions about demographic characteristics, self-reported health experience and reproductive healthcare use by women with physical and mobility disabilities. The study sample characteristics have been described in detail by our previous reports, including information about the sample’s experiences of reproductive healthcare use such as Pap smears and cervical cancer vaccine acceptability (Lin, Chen, et al., 2011; Yen et al., 2011). In this analysis, we recruited 502 women who could provide data on hysterectomies to examine its prevalence and correlated factors. We used SPSS 18.0 to analyze the data and employed a range of statistical methods (e.g., chi-squared tests). Multilevel logistic regression methods, odds ratio (OR) and 95% confidence interval (CI) all were used to examine the correlated factors to hysterectomies in women with physical and mobility disabilities in the study.

3. Results

The study showed that 11.3% of women with physical and mobility disabilities had hysterectomy surgery (Fig. 1). Table 1 showed that across the age distribution among hysterectomy cases, the surgery rate increased significantly in accordance with age. The hysterectomy prevalence in each age group was as follows: 7% (45–49 years), 9.7% (50–54 years), 26.3% (55–59 years), 31% (60–64 years) and 17.6% (≥ 65 years).

Table 2 shows the relation between hysterectomy prevalence and participants’ demographic characteristics with bivariate Chi-squared tests. We found that study participants who were older ($p < 0.001$), had lower educational levels ($p = 0.004$), had spinal cord impairment ($p < 0.001$), had multiple disabilities ($p < 0.001$) and reported a poor household

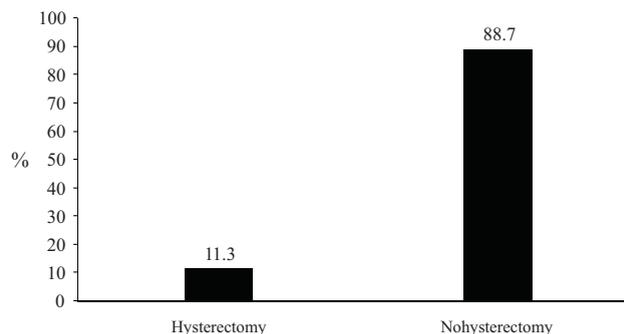


Fig. 1. Hysterectomy prevalence for women with physical and mobility disabilities ($N = 502$).

Table 1
Age and hysterectomy rates for women with physical and mobility disabilities ($N=482$).^a

Age (years)	N	Hysterectomy N (%)	No hysterectomy N (%)
<30	30	0 (0)	30 (100)
30–34	20	1 (5.0)	19 (95.0)
35–39	22	1 (4.5)	21 (95.5)
40–44	45	0 (0)	45 (100)
45–49	115	8 (7.0)	107 (93.0)
50–54	113	11 (9.7)	102 (90.3)
55–59	57	15 (26.3)	42 (73.7)
60–64	29	9 (31.0)	20 (69.0)
≥65	51	9 (17.6)	42 (82.4)

^a Missing data: 20.

economic situation ($p=0.006$) were statistically more likely to have had a hysterectomy than their counterparts. Hysterectomy was not significantly correlated with marital status, upper/lower limb or other nervous system impairments, and disability level.

We analyzed the relation between hysterectomy prevalence and participants' health experiences (Table 3). Our results showed that women who have had cervical cancer ($p < 0.001$) and have not had a Pap smear test within the last 3 years ($p = 0.018$) were more likely to have had a hysterectomy than their counterparts. Other factors such as tubal ligation, Pap smears (i.e., ever had, regularly have or had a Pap smear within the last year), understanding of and satisfactory level with Pap smear, and familiarity with Pap smear resources were not statistically correlated with hysterectomy rates among women with physical and mobility disabilities in our study.

We conducted multilevel logistic regression analyses to account for possible factors of hysterectomy prevalence among women with physical and mobility disabilities (Table 4). With model 1 analyzing predisposing factors which affect hysterectomy prevalence, the results show that women aged ≥ 50 years were more likely to have received a hysterectomy than women younger than 50 years (OR = 3.69, 95% CI = 1.54–8.82). Model 2 considered predisposing and enabling factors for hysterectomy prevalence, and we found that household income was not correlated with women's operations. Model 3 uses data concerning a need for hysterectomy surgery, and the results showed that women aged ≥ 50 years (OR = 4.65, 95% CI = 1.79–12.064), who have had cervical cancer (OR = 17.2, 95% CI = 3.5–84.47), and who have not had a Pap smear test in the last 3 years (OR = 2.79, 95% CI = 1.194–6.561) were more likely to have had a hysterectomy operation than their counterparts.

Table 2
Relations between hysterectomy and demographic characteristics of women with physical and mobility disabilities using Chi-squared tests.

Variable	No hysterectomy (%)	Hysterectomy (%)	χ^2	p value
Age ($N=482$)			17.765	<0.001
<50	241 (94.5)	14 (5.5)		
≥50	187 (82.4)	40 (17.6)		
Marital status ($N=501$)			0.322	0.571
Married	368 (88.5)	48 (11.5)		
Unmarried	77 (90.6)	8 (9.4)		
Education level ($N=500$)			8.291	0.004
Junior high school and less	192 (84.6)	35 (15.4)		
Senior high school and more	253 (92.7)	20 (7.3)		
Upper limb ($N=502$)			0.978	0.323
Yes	146 (90.7)	15 (9.3)		
No	299 (87.7)	42 (12.3)		
Lower limb ($N=501$)			0.167	0.682
Yes	323 (89.0)	40 (11.0)		
No	121 (87.7)	17 (12.3)		
Spinal cord impairment ($N=501$)			15.482	<0.001
Yes	40 (72.7)	15 (27.3)		
No	404 (90.6)	42 (9.4)		
Other nervous system impairments ($N=501$)			1.076	0.300
Yes	30 (83.3)	6 (16.7)		
No	414 (89.0)	51 (11.0)		
Multiple disabilities ($N=460$)			12.458	<0.001
Yes	51 (77.3)	15 (22.7)		
No	361 (91.6)	33 (8.4)		
Disability level ($N=502$)			3.815	0.148
Mild	246 (90.1)	27 (9.9)		
Moderate	146 (89.6)	17 (10.4)		
Severe and profound	54 (81.8)	12 (18.2)		
Household economic situation ($N=491$)			7.628	0.006
Good (surplus)	191 (93.6)	13 (6.4)		
Poor (deficit)	246 (85.7)	41 (14.3)		

Table 3
Relations between hysterectomy and health experiences of women with physical and mobility disabilities using Chi-squared tests.

Variable	No hysterectomy (%)	Hysterectomy (%)	χ^2	<i>p</i> value
Tubal ligation (<i>N</i> = 485)			5.549	0.019
Yes	114 (85.7)	19 (14.3)		
No	326 (92.6)	26 (7.4)		
Cervical cancer (<i>N</i> = 500)			40.858	<0.001
Yes	8 (44.4)	10 (55.6)		
No	440 (91.3)	42 (8.7)		
Has ever had a Pap smear (<i>N</i> = 501)			2.287	0.130
Yes	323 (90.0)	36 (10.0)		
No	121 (85.2)	21 (14.8)		
Has had a Pap smear within the 1 year (<i>N</i> = 482)			1.341	0.247
Yes	180 (91.4)	17 (8.6)		
No	251 (88.1)	34 (11.9)		
Has had a Pap smear within the last 3 years (<i>N</i> = 454)			5.553	0.018
Yes	221 (92.9)	17 (7.1)		
No	186 (86.1)	30 (13.9)		
Has had a Pap smear regularly (<i>N</i> = 484)			0.559	0.455
Yes	122 (90.4)	13 (9.6)		
No	307 (88.0)	42 (12.0)		
Level of satisfaction with the Pap smear experience (<i>N</i> = 356)			0.181	0.671
Low	84 (91.3)	8 (8.7)		
High	237 (89.8)	27 (10.2)		
Understanding regarding Pap smear (<i>N</i> = 503)			2.979	0.084
Low	133 (85.3)	23 (14.7)		
High	314 (90.5)	33 (9.5)		
Level of familiarity with Pap smear related resources (<i>N</i> = 490)			0.189	0.664
Low	131 (89.7)	15 (10.3)		
High	304 (88.4)	40 (11.6)		

Table 4
Factors correlated with hysterectomy prevalence among people with physical and mobility disabilities using multilevel logistic regression analyses (*N* = 460).

Variable	Model I OR (95% CI)	Model II OR (95% CI)	Model III OR (95% CI)
Predisposing factors			
Age			
<50	1	1	1
≥50	3.69 (1.54–8.82)*	3.78 (1.58–9.04)*	4.65 (1.79–12.06)*
Education level			
Junior high school or less	1	1	1
Senior high school or more	0.86 (0.38–1.91)	1.0 (0.43–2.19)	1.25 (0.53–2.95)
Spinal cord impairment			
No	1	1	1
Yes	1.39 (0.44–4.44)	1.46 (0.46–4.7)	1.80 (0.55–5.91)
Multiple disabilities			
No	1	1	1
Yes	1.51 (0.56–4.04)	1.43 (0.53–3.84)	1.47 (0.53–4.07)
Enabling factors			
Household economic situation			
Good (surplus)		1	1
Poor (deficit)		0.57 (0.24–1.32)	0.57 (0.24–1.38)
Need factors			
Tubal ligation			
No			1
Yes			1.16 (0.48–2.78)
Cervical cancer			
No			1
Yes			17.2 (3.5–84.47)*
Has had a Pap smear within the last 3 years			
Yes			1
No			2.79 (1.19–6.56)*

* *p* value < 0.05.

4. Discussion

The present paper analyzes self-report data of hysterectomy prevalence and explores correlated factors among women with physical and mobility disabilities in Taiwan. Our study is one of the first to present data describing hysterectomy prevalence of women with a physical disability. We found that 11.3% of women with physical and mobility disabilities had hysterectomies and that prevalence increased significantly with women's age. Our findings for hysterectomy prevalence were higher than what has been found for the general population in a study conducted by [Chang, Chang, Ku, and Hu \(1995\)](#), which indicated that hysterectomy rates were between 6.4% and 10.1% for women aged 40–60 years. [Chang, Mao, and Hu \(1996\)](#) showed that the prevalence of hysterectomies in four communities ranged from 6.1% to 10.0% in Taiwan. However, in comparison to Western studies, women with physical and mobility disabilities seem to have lower hysterectomy rates than their counterparts. In the US, hysterectomies have been one of the most frequently performed inpatient surgeries since the 1960s, with an estimated 33% of women undergoing a hysterectomy by the age of 60 ([Centers for Disease Control, 1992](#)). [Palmer et al. \(1999\)](#) found that the prevalence of hysterectomy increased from 1.9% to 38.9% among African American women aged 30–34 years and 45–49 years, respectively. [Zhang et al. \(2005\)](#) investigated hysterectomy prevalence among American Indian women, finding that hysterectomy prevalence ranged from 24% to 34% across different age groups. Prevalence of hysterectomy was 22.2% in Ireland, and operation age peaked between 45 and 49 years ([Ong, Codd, Coughlan, & O'Herlihy, 2000](#)). In New Zealand, [Dharmalingam, Pool, and Dickson \(2000\)](#) analyzed a national dataset of women aged 20–59 years, and they found that women aged 35–54 years underwent hysterectomies at a 3-fold increased rate than women younger than 35 years, and approximately one-quarter of the women aged 50–54 had had hysterectomies.

With [Skea et al. \(2004\)](#) analyzing women's perceptions of the decision-making process regarding the use of hysterectomy for benign menstrual problems, researchers found that almost all women (97%) reported satisfaction with their decisions. However, some women had residual doubts regarding the appropriateness of hysterectomy. Overall, approximately 16% of women who have undergone a hysterectomy had the surgery for reasons that were judged to be clinically inappropriate. Only one study has shown significantly more hysterectomies which have been rated clinically inappropriate, as compared with the group mean in general population ([Bernstein et al., 1993](#)). In Taiwan, [Chao, Tseng, Su, and Chien \(2005\)](#) examined the rate of inappropriate hysterectomies, and they found that 74.2% of patients underwent hysterectomy for appropriate reasons, 5.6% for debatable reasons and 20.2% for inappropriate reasons. These studies suggest that gynecologists and physician organizations should take action to improve the appropriate use of hysterectomy.

Our study reports that participant factors such as older age, having cervical cancer, and not having a Pap smear test within the last 3 years are related to lower hysterectomy prevalence. In Western literature, [Zhang et al. \(2005\)](#) found that geographic area, prior pregnancy losses, higher educational attainment, and reduced use of one's language were associated with increased hysterectomy prevalence among American Indian women. [Bower et al. \(2009\)](#) evaluated the association between race and hysterectomy prevalence in a population-based cohort of US women, finding that black women demonstrated greater odds of hysterectomy compared to white women (OR = 3.52). [Brett and Higgins \(2003\)](#) also revealed that Hispanic women undergo fewer hysterectomies than non-Hispanic White women, implying that hysterectomy was positively associated with cultural norms. Therefore, [Palmer et al. \(1999\)](#) suggested that there may be nonmedical factors which could be modified to reduce the rate of hysterectomy among African-American women.

Among other socioeconomic factors associated with hysterectomy prevalence, many studies report that higher educational level, occupational attainment and family income are strong predictors of hysterectomy and are significantly associated with lower rates of hysterectomy operations ([Dharmalingam et al., 2000](#); [Marks & Shinberg, 1997](#)). [Hartow and Barbieri \(1999\)](#) found that less educated women were approximately four times more likely to have had a hysterectomy than more educated women. A possible explanation is that less educated women may delay seeking health services for gynecologic problems, which ultimately may result in needing a hysterectomy later on. [Palmer et al. \(1999\)](#) found that premenopausal hysterectomies were strongly associated with geographic region of residence, an earlier maternal age at first birth, a history of uterine fibroids and a history of endometriosis. Hysterectomy was only weakly associated with women's number of births and age at menarche, and it was not associated with history of tubal ligation.

There are many limitations that need to be addressed for this study. Our cross-sectional survey was not designed to determine the causal relationship between personal demographic characteristics and hysterectomy. Second, self-reports of hysterectomy may underestimate the prevalence of women with physical and mobility disabilities who have had hysterectomies due to cultural factors in Taiwan. Finally, we did not control for health providers, which may affect the acceptability of hysterectomy. We suggest that the future studies should analyze hospital data and assess long-term changes to better understand the hysterectomy profile and its correlated factors for this vulnerable population of women.

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References

- Becker, H., Stuifbergen, A., & Tinkle, M. (1997). Reproductive health care experiences of women with physical disabilities: A qualitative study. *Archives of Physical and Medical Rehabilitation*, 78, S26–S33.
- Bernstein, S. J., McGlynn, E. A., Siu, A. L., Roth, C. P., Sherwood, M. J., Keesey, J. W., et al. (1993). The appropriateness of hysterectomy: A comparison of care in seven health plans. *The Journal of the American Medical Association*, 269, 2398–2402.
- Borman, B., McKenna, S., & Findlay, J. (1986). Hysterectomies in New Zealand. *The New Zealand Medical Journal*, 99, 470.
- Bower, J. K., Schreiner, P. J., Sternfeld, B., & Lewis, C. E. (2009). Black–white differences in hysterectomy prevalence: The CARDIA study. *American Journal of Public Health*, 99, 300–307.
- Boyd, L. R., Novetsky, A. P., & Curtin, J. P. (2010). Effect of surgical volume on route of hysterectomy and short-term morbidity. *Obstetrics & Gynecology*, 116, 909–915.
- Brett, K. M., & Higgins, J. A. (2003). Hysterectomy prevalence by Hispanic ethnicity: Evidence from a national survey. *American Journal of Public Health*, 93, 307–312.
- Centers for Disease Control. (1992). Hysterectomy prevalence and death rates for cervical cancer – United States, 1965–1988. *Morbidity & Mortality Weekly Report*, 41, 17–20.
- Chang, C., Chang, C. H., Ku, S. F., & Hu, Y. H. (1995). A preliminary study on hysterectomy rate in Taiwan. *Chinese Journal of Public Health*, 14, 487–493.
- Chang, C., Mao, C. L., & Hu, Y. H. (1996). Prevalence of hysterectomy of Chinese women in Taiwan. *International Journal of Gynecology & Obstetrics*, 52, 73–74.
- Chao, Y. M., Tseng, T. C., Su, C. H., & Chien, L. Y. (2005). Appropriateness of hysterectomy in Taiwan. *Journal of the Formosan Medical Association*, 104, 107–112.
- Cheng, E., Myers, L., Wolf, S., Shatin, D., Cui, X. P., Ellison, G., et al. (2001). Mobility impairments and use of preventive services in women with multiple sclerosis: Observational study. *British Medical Journal*, 323, 968–969.
- Dharmalingam, A., Pool, I., & Dickson, J. (2000). Biosocial determinants of hysterectomy in New Zealand. *American Journal of Public Health*, 90, 1455–1458.
- Dicker, R. C., Scally, M. J., Greenspan, J. R., Layde, P. M., Ory, H. W., Maze, J. M., et al. (1982). Hysterectomy among women of reproductive age: Trends in the United States, 1970–1978. *The Journal of the American Medical Association*, 248, 323–327.
- Friedman, A. L., & Sheppard, H. (2007). Exploring the knowledge, attitudes, beliefs, and communication preferences of the general public regarding HPV: Findings from CDC focus group research and implications for practice. *Health Education & Behavior*, 34, 471–485.
- Hartow, B. L., & Barbieri, R. L. (1999). Influence of education on risk of hysterectomy before age 45 years. *American Journal of Epidemiology*, 150, 843–847.
- Hughes, R. B. (2006). Introduction to the theme issue on women and disabilities. *Women's Health Issues*, 16, 283–285.
- Kjerulff, K. H., Guzinski, G. M., Langenberg, P. W., Stolley, P. D., Moye, N. E., & Kazandjian, V. A. (1993). Hysterectomy and race. *Obstetrics & Gynecology*, 82, 757–764.
- Kjerulff, K., Langenberg, P., & Guzinkis, G. (1993). The socioeconomic correlates of hysterectomies in the United States. *American Journal of Public Health*, 83, 106–108.
- Kroll, T., Jones, G. C., Kehn, M., & Neri, M. T. (2006). Barriers and strategies affecting the utilisation of primary preventive services for people with physical disabilities: A qualitative inquiry. *Health and Social Care in the Community*, 14, 284–293.
- Lin, J. D., Chen, S. F., Lin, L. P., & Sung, C. L. (2011). Self-reports of Pap smear screening in women with physical disabilities. *Research in Developmental Disabilities*, 32, 456–461.
- Lin, J. D., Sung, C. L., Lin, L. P., Liu, T. W., Lin, P. Y., Chen, L. M., et al. (2010). Perception and experience of primary care physicians on Pap smear screening for women with intellectual disabilities: A preliminary findings. *Research in Developmental Disabilities*, 31, 440–445.
- Lin, L. P., Lin, P. Y., Chu, C., & Lin, J. D. (2011). Predictors of caregiver supportive behaviors towards reproductive health care for women with intellectual disabilities. *Research in Developmental Disabilities*, 32, 824–829.
- Lin, L. P., Lin, P. Y., Hsu, S. W., Loh, C. H., Lin, J. D., Lai, C. I., et al. (2011). Caregiver perception of reproductive health recognition and services for women with intellectual disabilities who are caring in welfare institutions. *BMC Public Health*, 11, 59.
- Marks, N. F., & Shinberg, D. S. (1997). Socioeconomic differences in hysterectomy: The Wisconsin longitudinal study. *American Journal of Public Health*, 87, 1507–1514.
- National Cancer Institute. (2010). *NCI Thesaurus, 2010_02D* < <http://ncit.nci.nih.gov/ncitbrowser> > Accessed 09.04.11.
- Oman, D., Reed, D., & Ferrara, A. (1999). Do elderly women have more physical disability than men do? *American Journal of Epidemiology*, 150, 834–842.
- Ong, S., Codd, M. B., Coughlan, M., & O'Herlihy, C. (2000). Prevalence of hysterectomy in Ireland. *International Journal of Gynecology & Obstetrics*, 69, 243–247.
- Palmer, J. R., Rao, R. S., Adams-Campbell, L. L., & Rosenberg, L. (1999). Correlates of hysterectomy among African-American women. *American Journal of Epidemiology*, 150, 1309–1315.
- Physically and Mentally Disabled Citizens Protection Act. (1980). *The whole enacted text of 26 articles promulgated by President Order Tai-Tung (1)-Yi-Tzu No. 3028 June 2, 1980*.
- Pokras, R., & Hufnagel, V. G. (1988). Hysterectomy in the United States 1965–1984. *American Journal of Public Health*, 78, 852–853.
- Rogo-Gupta, L. J., Lewin, S. N., Kim, J. H., Burke, W. M., Sun, X., Herzog, T. J., et al. (2010). The effect of surgeon volume on outcomes and resource use for vaginal hysterectomy. *Obstetrics & Gynecology*, 116, 1341–1347.
- Santow, G., & Bracher, M. (1992). Correlates of hysterectomy in Australia. *Social Sciences & Medicine*, 34, 929–942.
- Skea, Z., Harry, S., Bhattacharya, S., Entwistle, V., Williams, B., MacLennan, G., et al. (2004). Women's perceptions of decision-making about hysterectomy. *BJOG: An International Journal of Obstetrics and Gynaecology*, 111, 133–142.
- The American College of Obstetricians and Gynecologists. (2010). *Hysterectomy – Patient education pamphlet*. Washington, DC: ACOG. < http://www.acog.org/publications/patient_education/bp008.cfm > Accessed 09.04.11.
- Yen, C. F., Chen, S. F., Lin, L. P., Hsu, S. W., Chang, M. J., Wu, C. L., et al. (2011). The acceptability of human papillomavirus (HPV) vaccination among women with physical disabilities. *Research in Developmental Disabilities*, 32, 2020–2026.
- Zhang, Y., Lee, E. T., Cowan, L. D., North, K. E., Wild, R. A., & Howard, B. V. (2005). Hysterectomy prevalence and cardiovascular disease risk factors in American Indian women. *Maturitas*, 52, 328–336.