GYNAECOLOGY

Proportion and Factors Associated with Anxiety in Women with Abnormal Cervical Cancer Screening at King Chulalongkorn Memorial Hospital

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ABSTRACT

Objectives: The primary objective was to examine the proportion of anxiety among women who had abnormal cervical cancer screening result and those who underwent routine cervical cancer screening at King Chulalongkorn Memorial Hospital (KCMH). The secondary objectives were to study the associated factors of anxiety and determine issues of concern in women after cervical cancer screening.

Materials and Methods: A cross-sectional study was performed. From sample size calculation, 118 participants per group were needed. While adding 10% dropout, therefore 130 participants per group were recruited. We recruited 130 women who had abnormal cervical cancer screening result who visited colposcopy clinic and 130 asymptomatic participants who underwent cervical cancer screening. Self-administered questionnaire composed of 6 parts and 104 items. Thai version of Spielberger State-Trait Anxiety Inventory was used to determine anxiety with the cut-off score of 40. Thai-version of Jalowiec Coping Scale was used to assess coping style. Statistical analysis was performed by SPSS version 22.0. Univariable and multivariable analysis with p value of < 0.05 was used.

Results: One hundred and nineteen women who had abnormal cervical cancer screening and 121 asymptomatic participants were enrolled. The proportion of anxiety in the abnormal cervical cancer screening group was significantly higher than the control group (65.5% vs. 47.1%; p = 0.002). Multivariable analysis that showed abnormal Pap smear result and anxiety trait were significantly associated with anxiety (Odds ratio (OR) = 3.39; 95% confidence interval (CI) 1.58-7.26 and OR = 16.68; 95%CI 7.76-35.88, respectively). Concern of having cancer was found to be high in both groups, but it was significantly higher among those with anxiety (43.8% vs. 18.4%, p = 0.026).

Conclusions: Women with abnormal cervical screening had significantly higher anxiety. Therefore, counselling and psychological support were required in this group.

Keywords: abnormal cervical cancer screening, PAP smear, anxiety, the spielberger state-trait anxiety inventory, jalowiec coping scale.

สัดส่วนและปัจจัยที่มีผลต่อภาวะวิตกกังวลในสตรีที่มีผลคัดกรองมะเร็งปากมดลูกผิดปกติ ณ โรงพยาบาลจุฬาลงกรณ์

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บทคัดย่อ

วัตถุประสงค์: วัตถุประสงค์หลักเพื่อศึกษาหาสัดส่วนของภาวะวิตกกังวลระหว่างกลุ่มที่มีผลคัดกรองมะเร็งปากมดลูกผิดปกติ และกลุ่มสตรีที่เข้ารับการตรวจคัดกรองมะเร็งปากมดลูก ณ โรงพยาบาลจุฬาลงกรณ์ วัตถุประสงค์รองเพื่อศึกษาปัจจัยที่มีผลต่อภาวะวิตกกังวล และค้นหาประเด็นที่วิตกกังวลในสตรีหลังเข้ารับการตรวจคัดกรองมะเร็งปากมดลูก

วัสดุและวิธีการ: เป็นการศึกษาแบบตัดขวาง ในการคำนวณขนาดตัวอย่างพบว่าต้องการผู้เข้าร่วมวิจัยกลุ่มละ 118 คน กำหนดอัตราการถอนตัวจากการศึกษาร้อยละ 10 ดังนั้นจึงต้องการผู้เข้าร่วมวิจัยกลุ่มละ 130 คน ได้แก่ สตรี 130 คนที่มีผลคัดกรองมะเร็งปากมดลูกผิดปกติ และได้เข้ารับการตรวจส่องกล้องปากมดลูกที่คลินิก colposcopy และอีกกลุ่มสตรี 130 คนที่เข้ารับการตรวจคัดกรองมะเร็งปากมดลูกที่คลินิกนรีเวชกรรม โดยไม่มีอาการอื่น ๆ ทางนรีเวช จากนั้นเก็บข้อมูลในรูปแบบของแบบสอบถามแบบเติมตอบเอง ซึ่งประกอบด้วย 6 ตอน ทั้งหมด 104 ข้อ แบบวัดความวิตกกังวล (The Spielberger State-Trait Anxiety Inventory) ฉบับภาษาไทย ถูกนำมาใช้ในการวินิจฉัยภาวะวิตกกังวล โดยเกณฑ์การวินิจฉัยคือคะแนน ≥ 40 และใช้แบบประเมินวิธีการเผชิญปัญหา (Jalowiec Coping Scale) ฉบับภาษาไทย เพื่อศึกษาหนึ่งในปัจจัยที่มีผลต่อภาวะวิตกกังวล การวิเคราะห์ข้อมูล ทำโดยโปรแกรม SPSS version 22.0 สำหรับสถิติที่ใช้วิเคราะห์ใช้ทั้งการวิเคราะห์ตัวแปรตัวเดียว และพหุตัวแปร ค่า p value น้อยกว่า 0.05 ถือว่ามีนัยสำคัญทางสถิติ

ผลการศึกษา: สตรี 119 คน เข้าร่วมในกลุ่มผลคัดกรองมะเร็งปากมดลูกผิดปกติ และ 121 คน เข้าร่วมในกลุ่มที่เข้ารับการตรวจคัดกรองมะเร็งปากมดลูกและไม่มีอาการผิดปกติ สัดส่วนของภาวะวิตกกังวลในกลุ่มผลคัดกรองมะเร็งปากมดลูกผิดปกติสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ (65.5% vs. 47.1%; p = 0.002) การวิเคราะห์พหุตัวแปรพบว่าปัจจัยที่มีผลต่อภาวะวิตกกังวล ได้แก่ ผลคัดกรองมะเร็งปากมดลูกที่ผิดปกติ และพื้นนิสัยวิตกกังวล (Odds ratio (OR) = 3.39; 95% confidence interval (CI) 1.58-7.26 และ OR = 16.68; 95%CI 7.76-35.88 ตามลำดับ) ประเด็นที่มีความกังวลมากที่สุดในประชากรทั้งสองกลุ่ม คือ ความกังวลต่อการเป็นมะเร็ง (43.8% vs. 18.4%, p = 0.026)

สรุป: สตรีที่มีผลคัดกรองปากมดลูกผิดปกติมีความวิตกกังวลสูงอย่างมีนัยสำคัญ ดังนั้นจึงจำเป็นต้องมีการแนะนำ ให้คำปรึกษา และการดูแลทางจิตใจในกลุ่มนี้อย่างเป็นพิเศษ

คำสำคัญ: ผลคัดกรองมะเร็งปากมดลูกผิดปกติ, แปปสเมียร์, ความวิตกกังวล, แบบวัดความวิตกกังวลของสปิลเบอร์เกอร์, แบบประเมินวิธีการเผชิญปัญหาของจาโลวิค

Introduction

Cervical cancer is a common gynecological cancer. According to the World Health Organization (WHO) report, the incidence of cervical cancer is the fourth most common cancer in the world, affecting nearly 570,000 new cases a year and 90% of cervical cancer death is reported in developing countries[1]. In Thailand, according to the National Cancer Institute's report, the incidence of cervical cancer is the third highest. There was an average of 11.7 new cases of cervical cancer per 100,000 population[2].

Human papillomavirus (HPV) infection is believed to be the primary cause of cervical cancer. Evidence shown persistent high-risk oncogenic HPV infection is the principal risk factor for the development of cervical intraepithelial neoplasia[3]. These lesions if left untreated can progress to cervical cancer[4]. Screening for cervical cancer precursors using cervical cytology is successful in reducing the incidence of cervical cancer[3]. In Thailand, cervical cytology, the Papanicolaou (Pap) test, is widely used for standard cervical cancer screening[5].

Many studies reported that women with abnormal cervical cytology (Pap test) significantly had higher anxiety[6-11]. This psychological consequence has a low to medium impact on daily life, sleep pattern, family life, sexual interest[6-7] and considerable impact on follow-up visits[8]. The anxiety can even be long-lasting up to 2 years[9].

Despite the high prevalence of anxiety in patients who have abnormal cervical screening from previous reports, there remains a low rate of anxiety detected and referral to a psychiatrist for proper management. Moreover, in Thailand, there was only a study regarding anxiety after diagnosed abnormal Pap test[11]. However, the factors associated with anxiety have not been studied[11]. Therefore, we used Spielberger State-Trait Anxiety Inventory to determine anxiety and Thai-version of Jalowiec Coping Scale to assess coping style. These questionnaires can give us answers about anxiety, factors associated with anxiety and coping scale which are different from the previous study. This study was aimed to compare a proportion of anxiety between women who had abnormal cervical cancer screening result (study group) and those who underwent cervical cancer screening (control group) in a tertiary hospital. Besides, we also studied the factors associated with anxiety and identify the anxiety issue in women after cervical cancer screening as the secondary objective.

Materials and methods

This cross-sectional study was conducted at King Chulalongkorn Memorial Hospital (KCMH), a tertiary care center in Bangkok, Thailand, between April 2019 and April 2020. The data were collected in 2 groups of the population from 2 outpatient clinics. The women who had abnormal cervical cancer screening result were assigned as the study group and asymptomatic women who underwent cervical cancer screening were assigned as the control group. The study group was recruited from colposcopy clinic and the control group was recruited from the gynecologic clinic.

As for sample size calculation, the two independent proportions (without continuity correction) formula was used. From Jeerachotechueantaveechai, et al 2015[11], we defined proportion in study group and control group were 0.14 and 0.03, respectively. The sample size also calculated from ratio 1:1, alpha and beta errors were 0.05 and 0.2, respectively. One hundred and eighteen subjects per group were needed. After adding 10% for dropout, therefore 130 subjects per group were needed. The study group was recruited from women who had abnormal cervical cancer screening and had visited the colposcopy clinic and participants in the control group were recruited from asymptomatic women who underwent cervical cancer screening.

The inclusion criteria included women aged between 18 and 65-year-old who can read and write Thai language. The exclusion criteria were pregnancy, history of hysterectomy, history of psychological disease, mental retardation, and history of gynecological cancer.

Self-administered questionnaires were completed by the subjects in both groups. The questionnaires comprised of 6 parts with 104 items. Part 1 was demographic and clinical data. Part 2 was the Thai-version of Spielberger State-Trait Anxiety Inventory-Trait version (STAI-T)[12] which used to assess anxiety trait. Part 3 was the Thai-version of Jalowiec Coping Scale (JCS), used to measure coping style. The JCS (1984) composed of 40 items[16]. The Thai version JCS was translated and revised by Sangchan (1988)[17] and Cheewapoonpol (2004)[18], which composed of 36 items and those were rated on a five-point scale (1 to 5). The total score ranging from 36 to 180, which were divided into 3 coping styles namely: 1) problem confrontation (13 items with the score ranging from 13 - 65), 2) emotional management (9 items with the score ranging from 9 - 45) and 3) problem alleviation (14 items with the score ranging from 14 - 70). The interpretation used the mean score in each coping style. The coping behavior was interpreted in 3 levels: low, intermediate and high levels of using the certain type of coping style, from mean score 1.0-2.33, 2.34-3.67 and 3.68-5.00, respectively. The Cronbach's alpha coefficient of this scale was 0.72[18-19]. Part 4 was the Thai-version of Spielberger State-Trait Anxiety Inventory- State version (STAI-S)[12] that used to measure anxiety state. Anxiety state represents anxiety at a particular moment, whereas anxiety trait represents anxiety level that a participant usually feels. The STAI-T and STAI-S were comprised of 20 items that were rated on a four-point scale (1 to 4), with a score ranging from 20 to 80. The score of 40 and higher was considered as having significant anxiety trait/ state. The Spielberger State-Trait Anxiety Inventory (STAI)[12] was the most widely researched and used for measures of general anxiety, and available in many different languages[13]. The Thai version STAI was translated by Nontasak and Iamsupasit. It had good validity and reliability. Cronbach's alpha coefficient and test-retest reliability were 0.86 - 0.92 and 0.73-0.92, respectively[14-15]. Part 2-4 of the questionnaire had already been permitted by authors via email. Part 1-3 of the questionnaire was used to study the factors associated with anxiety, as the secondary outcome. Part 4 was used for diagnosed anxiety as the primary outcome. Part 5 was 8-item questionnaire used to assess issues of patients' concern, and part 6 was 5-item questionnaire to used assess the patients' help needs from medical personnel. Part 5 - 6 of the questionnaires were developed by us and we had performed a pilot study among 8 subjects. The Cronbach's alpha coefficient and the test-retest reliability of part 5 and part 6 were 0.865 and 0.84, 0.95 (0.78-0.99) and 0.73 (0.11-0.94), respectively.

This study has been approved by the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University (IRB No. 093/63). All the patients provided written informed consent after receiving thorough information.

Statistical analysis was performed by SPSS version 22.0. Number, percentage and mean ± standard deviation (SD) were used for descriptive statistic. Chi-square test was used for comparing the proportion of anxiety between both population groups. For study factors and anxiety issue that associated with anxiety in this study, we used univariate analysis with chi-square test, Fisher exact test and unpaired t-test and used multivariate analysis with logistic regression. An overall statistical significance was considered when the p value of < 0.05.

Results
A total of 130 participants per group were

recruited and screened with inclusion criteria into this study. After excluded by exclusion criteria 240 patients were enrolled to the study; 119 patients were in the study group and 121 in the control group (Fig. 1)

Most of the baseline characteristics of the participants between the study group and the control group are summarized in Table 1. There were no significant differences between the two groups in the aspect of underlying disease, family history of cancer and anxiety trait. However, there are some differences characteristics between two groups. There was higher rate of multiple sexual partners in the study group (26% vs. 3.3% in the control group). The average of number sexual partner in a lifetime in the study group was 2 partners (ranging 1-5) compared with 1 partner (ranging 0-3) in the control group. The proportion of patients who had never done Pap test in the study group was higher than the control group (21.8% vs. 10.7%).

In the control group, all subjects had normal previous Pap test result. On the contrary, half of the subjects in the study group had history of abnormal Pap test result (50.5%). As for the current Pap test results in the study group, 39.5% had atypical squamous cells of undetermined significance (ASC-US); 35.3% had low-grade squamous intraepithelial lesion (LSIL); 10.9% had atypical squamous cells cannot exclude HSIL (ASC-H); 10.9% had high grade squamous intraepithelial lesion (HSIL); 2.5% had atypical glandular cells (AGC); and 0.8% had squamous cell carcinoma (SCC). We defined ASC-US and LSIL as low-grade abnormality and the others were high-grade abnormality. All subjects in the control visited the gynecologic clinic for checkup and had no gynecological symptoms. On the contrary, almost half (48.7%) of the subjects in the study group had gynecological symptoms such as: 21.6% had abnormal menstruation; 19.6% had abnormal vaginal discharge; 19.6% had pelvic pain; 16.5% had foul smell of genitalia; 15.5% had abnormal vaginal bleeding; and 7.2% had pelvic mass.

From the total of 240 women, 137 (57%) had anxiety (the STAI-State score > 40). The women who had abnormal cervical cancer screening result (study group) had significantly higher proportion of anxiety than women who underwent cervical cancer screening (control group) (67.2% vs. 47.1%, p = 0.002). Mean score of the STAI-state in the study group and the control group were 43.2 ± 7.9 (score range 25-64) and 39.8 ± 6.5 (score range 24-56), respectively (p < 0.001).
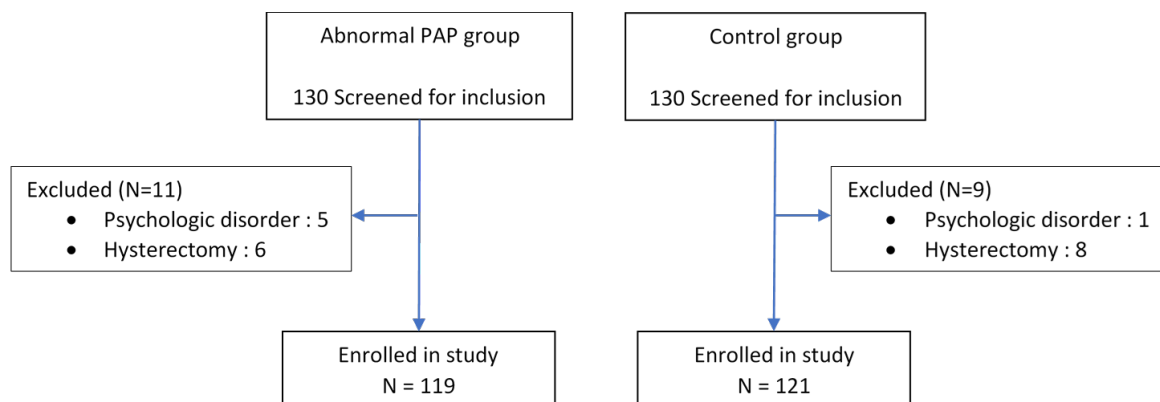

Fig. 1. Consort diagram.

Table 1. Baseline characteristics of the subjects between the study group (abnormal Pap group) and control group (check-up group).

Characteristics	Study group (N = 119)	Control group (N = 121)
Age (years) (mean ± SD)	40 ± 10.1	43.2 ± 11.0
Parity, n (%)		
Multiparous	68 (57.1)	0.91
Nulliparous	51 (42.9)	0.96
Marriage status, n (%)		
Single	39 (32.8)	21 (17.4)
Married	59 (49.6)	93 (76.9)
Separated/Widowed	21 (17.6)	7 (5.8)
Education, n (%)		
Primary	15 (12.6)	9 (7.4)
Secondary	30 (25.2)	62 (51.2)
University	74 (62.2)	50 (41.3)
Income (Baths/month), n (%)		
0-15,000	39 (32.8)	27 (22.3)
15,001-30,000	40 (33.6)	84 (69.4)
30,001-50,000	26 (21.8)	7 (5.8)
> 50,000	14 (11.8)	3 (2.5)
Sexual partner, n (%)		
≥ 2	31 (26.0)	4 (3.3)
0-1	59 (49.5)	95 (78.5)
N/A	29 (24.3)	22 (18.1)
Number of sexual partners in a lifetime (mean ± SD)	2 ± 1	1 ± 0
Age at first SI (years) (mean ± SD)	22 ± 5.4	23.7 ± 6.7
Underlying disease, n (%)		
No	88 (73.9)	86 (71.1)
Yes	31 (26.1)	35 (28.9)
History of cancer, n (%)		
No	110 (92.4)	119 (98.3)
Yes	9 (7.6)	2 (1.7)
Family history of cancer, n (%)		
No	98 (82.4)	119 (98.3)
Yes	21 (17.6)	2 (1.7)
Interval from last PAP smear, n (%)		
Never	26 (21.8)	13 (10.7)
1-3 years	86 (72.3)	77 (63.6)
> 3 years	7 (5.9)	31 (25.6)
Anxiety trait (STAT-TRAIT), n (%)		
Yes (≥ 40)	73 (60.3)	74 (62.2)
No (< 40)	48 (39.7)	45 (37.8)
Jalowiec Coping Scale, n (%)		
A. Problem Confrontation		
Low use	15 (12.4)	5 (4.2)
Intermediate use	69 (57)	61 (51.3)
High use	37 (30.6)	53 (44.5)
B. Emotional management		
Low use	65 (53.7)	45 (37.8)
Intermediate use	46 (46.3)	74 (62.2)
C. Problem alleviation		
Low use	25 (20.7)	11 (9.2)
Intermediate use	86 (71.1)	96 (80.7)
High use	10 (8.3)	12 (10.1)

SD: standard deviation, SI: sexual intercourse, PAP: Papanicolaou test, STAI: The State-Trait Anxiety Inventory, N/A: Not available

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Factors associated with anxiety in this study are presented in Table 2. Univariable analysis showed many factors including population groups, age, history of Pap result, having abnormal vaginal discharge, having pelvic mass, and having anxiety trait were significantly associate with anxiety. Due to the differences in baseline characteristics between 2 population groups, the multivariable analysis was performed by backward logistic regression. The population groups and anxiety trait significantly affected anxiety state (Odds ratio (OR) = 3.39; 95%

confidence interval (CI) 1.58-7.26 and OR = 16.68; 95%CI 7.76-35.88, respectively). On subgroup analysis of current Pap result, Table 2 also shows a comparison between the severity of cervical cytology, high grade abnormality/NILM, low grade abnormality/NILM (NILM = reference) and anxiety. There was no significance between severity of cervical cytology and anxiety. However, these results should be interpreted with caution because of the small number of women who had high grade abnormality in this cohort.

Table 2. Univariable and multivariable analysis for factors associated with anxiety.

Factors	Anxiety N=137 n (%)	No anxiety N=103 n (%)	Univariable analysis		Multivariable analysis[d]	
			Odds ratio (95%CI)	p value	Adjusted OR[e] (95%CI)	p value
Groups						
Abnormal PAP smear	80 (58.4)	39 (37.9)	2.30 (1.37-3.89)	0.002[a]	3.39 (1.58-7.26)	0.002
Check up	57 (41.6)	64 (62.1)				
Age (years) (mean ± SD)	40.2 ± 10.4	43.4 ± 10.8	0.95 (0.95-0.99)	0.023[c]	0.99 (0.95-1.02)	0.426
Parity						
Multiparous	50 (36.5)	26 (25.2)	0.59 (0.33-1.03)	0.065[a]	-	-
Nulliparous	87 (63.5)	77 (74.8)				
Marriage status						
Single	38 (27.7)	22 (21.4)	0.75 (0.49-1.17)	0.207[a]	-	-
Married	85 (62.1)	67 (65.0)				
Divorced/Widowed	14 (10.2)	14 (13.6)				
Education						
Primary	14 (10.2)	10 (9.7)	1.08 (0.73-1.58)	0.707[a]	-	-
Secondary	50 (36.5)	42 (40.8)				
University	73 (53.3)	51 (49.5)				
Income (Baths/month)						
0 - 15,000	41 (29.9)	25 (24.3)	0.94 (0.69-1.27)	0.688[a]	-	-
15,001 - 30,000	68 (49.6)	56 (54.4)				
30,001 - 50,000	17 (12.4)	16 (15.5)				
> 50,000	11 (8.0)	6 (5.8)				
Sexual partner						
≥ 2	20 (14.6)	15 (14.6)	1.05 (0.50-2.21)	0.889[a]	-	-
0-1	86 (62.3)	68 (66.0)				
N/A	31 (22.6)	20 (19.4)				
Age at first SI (years) (mean ± SD)	22.1 ± 5.9	23.2 ± 6.1	0.97 (0.93-1.02)	0.235[c]	-	-
History of cancer						
Yes	6 (4.4)	5 (4.9)	0.94 (0.48-1.83)	0.853[a]	-	-
No	131 (95.6)	98 (95.1)				
Family history of cancer						
Yes	24 (17.5)	19 (18.4)	0.94 (0.48-1.83)	0.853[a]	-	-
No	113 (82.5)	84 (84)				
Underlying disease						
Yes	35 (25.5)	31 (30.1)	0.80 (0.45-1.41)	0.435[a]	-	-
No	102 (74.5)	72 (69.9)				

Table 2. Univariable and multivariable analysis for factors associated with anxiety. (Cont.)

Factors	Anxiety N=137 n (%)	No anxiety N=103 n (%)	Univariable analysis		Multivariable analysis[d]	
			Odds ratio (95%CI)	p value	Adjusted OR[e] (95%CI)	p value
History of PAP result						
Abnormal	33 (28.9)	13 (14.9)	2.32 (1.13-4.74)	0.021[a]	1.11 (0.36-3.42)	0.856
Normal	81 (71.1)	74 (85.1)				
Interval from last PAP smear						
Never	23 (16.8)	16 (15.5)	1.15 (0.73-1.80)	0.554[a]	-	-
1-3 years	89 (65.0)	74 (71.8)				
> 3 years	25 (18.2)	13 (12.6)				
Current PAP result						
High grade lesion	20 (14.6)	10 (9.7)	2.25 (0.97-5.20)	0.055[a]	-	-
Low grade lesion	60 (43.8)	29 (28.2)	2.32 (1.32-4.10)	0.003[a]		
NILM	57 (41.6)	64 (62.1)	(reference)			
Gynecological symptom						
Yes	39 (28.5)	19 (18.4)	1.76 (0.95-3.27)	0.075[a]	-	-
No	98 (71.5)	84 (81.6)				
Abnormal discharge						
Yes	16 (11.7)	3 (2.9)	4.41 (1.25-15.56)	0.021[a]	1.67 (0.32-8.64)	0.541
No	121 (88.3)	100 (97.1)				
Pelvic mass						
Yes	7 (5.1)	0 (0)	_[f]	0.021[b]	_[f]	0.999
No	130 (94.9)	103 (100)				
Abnormal bleeding						
Yes	8 (5.8)	7 (6.8)	0.85 (0.30-2.43)	0.762[a]	-	-
No	129 (94.2)	96 (93.2)				
Abnormal menstruation						
Yes	15 (10.9)	6 (5.8)	1.99 (0.74-5.32)	0.171[a]	-	-
No	122 (89.1)	97 (94.2)				
Pelvic pain						
Yes	11 (8.0)	8 (7.8)	1.04 (0.40-2.68)	0.941[a]	-	-
No	126 (92.0)	95 (92.2)				
Foul smell						
Yes	12 (8.8)	4 (3.9)	2.38 (0.74-7.59)	0.144[a]	-	-
No	125 (91.2)	99 (96.1)				
Anxiety trait (STAT-TRAIT)						
Yes (score ≥ 40)	116 (84.7)	31 (30.1)	12.83 (6.85-24.02)	< 0.001[a]	16.68 (7.76-35.88)	< 0.001
No (score < 40)	21 (15.3)	72 (69.9)				
Jalowiec Coping Scale						
A. Problem Confrontation						
Low use	49 (35.8)	41 (39.8)	0.92 (0.60-1.39)	0.676[a]	-	-
Intermediate use	77 (56.2)	53 (51.5)				
High use	11 (8.0)	9 (8.7)				
B. Emotional management						
Low use	91 (66.4)	39 (37.9)	3.25 (1.91-5.53)	< 0.001[a]	1.26 (0.61-2.60)	0.537
Intermediate use	46 (33.6)	64 (62.1)				
C. Problem alleviation						
Low use	11 (8.0)	11 (10.7)	1.15 (0.68-1.95)	0.292[a]	-	-
Intermediate use	109 (79.6)	73 (70.9)				
High use	17 (12.4)	19 (18.4)				

OR: odds ratio, CI: confidence interval, SD: standard deviation, SI: sexual intercourse, PAP: Papanicolaou test, NILM: negative for intraepithelial lesion, STAI: The State-Trait Anxiety Inventory Low grade lesion: ASC-US(Atypical squamous cells of undetermined significance), LSIL (Low-grade squamous intraepithelial lesion) High grade lesion: ASC-H(Atypical squamous cells cannot exclude HSIL), HSIL (High grade squamous intraepithelial lesion), SCC (Squamous cell carcinoma), AGC (Atypical glandular cells). [a] Chi-square test, [b] Fisher's Exact test, [c] Unpaired T-test, [d] Backward logistic regression analysis, [e] Adjusted OR: variables which were significantly associated with anxiety in the univariable logistic regression model were further examined by the multivariable backward regression analysis; adjust for age, history of PAP result, current PAP result, abnormal discharge, pelvic mass and emotive coping, [f] one cell = 0, cannot calculate the odds ratio

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Issues of concern associated with anxiety state in this study are presented in Table 3. From a 5-point Likert scale, the score up to 4 was considered as concern in that topic. Multivariable analysis was performed by binary logistic regression. When the population group was controlled, the remaining significant anxiety issue was afraid of cancer in both anxiety and no anxiety group (43.8% vs. 18.4%; p = 0.026).

Additional analysis of the patients' help needs from medical personnel is summarized in Table 4. This part had 5 items with a 5-point Likert scale (1 = I absolutely don't need this; 2 = I don't need this; 3 = neutral; 4 = I need this; and 5 = I absolutely need this). The score 4 and 5 were considered as "need". We studied all population and subgroup analysis in the study group and control group. The most two patients' needs from healthcare providers were information about self-care management, and disease and treatment.

Table 3. Univariable and multivariable analysis for identifying the anxiety issues associated anxiety state.

Anxiety issues	Anxiety N=137 n (%)	No anxiety N=103 n (%)	Univariable analysis[a] p value	Multivariable analysis[b] p value
1. Concern of having a cancer				
Yes	60 (43.8)	19 (18.4)	< 0.001	0.026
No	77 (56.2)	84 (81.6)		
2. Concern about treatment procedures (surgery/chemotherapy/radiation)				
Yes	60 (43.8)	23 (22.3)	0.001	0.080
No	77 (56.2)	80 (77.7)		
3. Concern to be a sick person				
Yes	56 (40.9)	26 (25.2)	0.011	0.289
No	81 (59.1)	77 (74.8)		
4. Concer about cost of treatment				
Yes	61 (44.5)	30 (29.1)	0.015	0.383
No	76 (55.5)	73 (70.9)		
5. Concern about death				
Yes	49 (35.8)	22 (21.3)	0.016	0.546
No	88 (64.2)	81 (78.6)		
6. Concern to be a burden				
Yes	87 (63.5)	50 (48.5)	0.020	0.747
No	50 (36.5)	53 (51.5)		
7. Concern about duration of treatment				
Yes	52 (38.0)	26 (25.2)	0.037	0.626
No	85 (62.0)	77 (74.8)		
8. Concern about sexual and reproductive problems				
Yes	29 (21.2)	13 (12.6)	0.085	-
No	108 (78.8)	90 (87.4)		
Group				
Study group	80 (58.4)	39 (37.9)	0.002	0.040
Control group	57 (41.6)	64 (62.1)		

Concern = score 4-5, No concern = score 1-3, [a] Chi-square test, [b] Binary logistic regression

Table 4. Univariable and multivariable analysis for identifying the anxiety issues associated anxiety state.

Patients' need, n (%)	All participants (N=240)		Study group (N=119)		Control group (N=121)	
1. Information regarding disease & treatment	113 (47.1)	127 (52.9)	44 (37)	75 (63)	69 (57)	52 (43)
2. Psychological Support	161 (67.1)	79 (32.9)	80 (67.2)	39 (32.8)	81 (66.9)	40 (33.1)
3. Financial support	163 (67.9)	77 (32.1)	74 (62.2)	45 (37.8)	89 (73.6)	32 (26.4)
4. Self-care management	107 (44.6)	133 (55.4)	45 (37.8)	74 (62.2)	62 (51.2)	59 (48.8)
5. Sexual education	165 (68.8)	75 (31.2)	77 (64.7)	42 (35.3)	88 (72.7)	33 (27.3)

* Need-score 4-5, Do not need = score 1-3

Discussion

Our first major finding was that women, after diagnosed with abnormal cervical cytology (Pap test), had a significantly higher proportion of anxiety than asymptomatic women who underwent cervical cancer screening and the other significant associated factors with anxiety were having anxiety trait and concern of having a cancer.

Regarding baseline characteristics of all subjects, when compared between women in abnormal Pap group and control group found that the abnormal Pap group were a higher number of the sexual partner in a lifetime, earlier age at first sexual activity, higher in the percentage of low income and higher number of who have never been screen. So, these findings were consistent with a fact of risk factors for cervical cancer[20].

Regarding to the primary outcome, this study result was consistent to many previous studies from other countries[6,10-11]. Women, after being diagnosed as having abnormal cervical cancer screening result, had a significantly high prevalence of anxiety about 14-59%[6,10-11]. However, the prevalence of anxiety in our study was slightly higher than previous studies. This may be due to the difference of instrument to detect anxiety. The previous study in Thailand[11] used the Hospital Anxiety and Depression Scale (HADS) to access anxiety. Conversely, we used STAI to measure. STAI was the most widely researched and used for measuring general anxiety; it had good validity and reliability and available in many different languages including Thai[13]. Moreover, it can also access the anxiety trait which can use to study the factor associated with anxiety.

According to factors associated with anxiety, the previous study in the northern Thailand[11] reported that no independent predicting factors for anxiety were identified in their study. They used only the general data for identify the factors. On the other hand, our study sought more factors and used additional questionnaires (the STAI-trait and Jalowiec coping scale) to study other anxious factors. Findings from the univariable analysis that women who diagnosed anxiety were average younger than no anxious women may be from low experience in their life and high emotive coping type. The anxious group had more complaint of gynecological symptoms and more patients who had abnormal previous Pap result. By multivariable analysis, the two significant factors associated with anxiety were population groups and anxiety trait. Therefore, we could use anxiety trait for predicting anxiety in patients who had abnormal cervical cancer screening (Pap test). Further outcomes, the significant anxiety issue was concern of having a cancer and the top 2 patients' needs from medical personnel were self-care management and information regarding disease and treatment.

There were several strengths in this study. Firstly, the study design was an analytical study. Secondly, we used the most widely used and good reliability/validity questionnaire to access the anxiety state. Thirdly, this study sought to identify more factors associated with anxiety than the previous studies. Finally, this study reported many outcomes including the proportion of anxiety in abnormal cervical cancer screening group, factors associated with anxiety, the anxiety issue and the patients' needs from healthcare providers, enabling us to comprehensively understand and realize the anxiety in the women who had abnormal cancer screening.

Our study has some limitations. First, it had different baseline characteristics of the population between the study group and the control group, as a result of data collection with the unmatched populations. However, multivariable analysis was performed to minimize the discrepancy. Second, there were just two significant factors associated with anxiety. Due to the sample size calculation in this study was used to prove the primary objective. Thus, the secondary outcome might be limited. For future research, larger sample size with matched populations is needed to determine factors affecting anxiety.

Although the high proportion of anxiety in abnormal Pap group is not surprising. The concern if physician in this aspect is still limited. It is remaining a low rate of anxiety detection and limited to psychiatric

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professional referral for appropriate treatment. Therefore, we should emphasize the importance of these issues. We should pay special attention through psychological support and counselling focus on self-care management and disease and treatment information. Generally, in Thailand women who were screen with Pap test receive the report via postal letters or telephone within 2 weeks to 1 month. For those who had abnormal Pap test, we should expedite the reporting process in the policy and should add the disease and treatment information or counselling note in the report. In this suggestion, it can be a way to reduce anxiety in women with abnormal Pap test.

Conclusion

This study demonstrated that women with abnormal cervical cancer screening result had high proportion of anxiety (67.2%). The two significant factors associated with anxiety were having abnormal cervical cancer screening and having anxiety trait. Having cancer was the significant issue that anxious participants were concerned with. Lastly, clinicians should realize these issues and give special attention through psychological support and counselling focusing on self-care management and disease and treatment information.

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Potential conflicts of interest

The authors declare no conflict of interest.

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