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CORRELATES OF PSYCHOLOGICAL DISTRESS IMMEDIATELY FOLLOWING COLPOSCOPY

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Abstract

Objective: Women are at risk for prolonged psychological distress following attendance at colposcopy for cervical abnormalities, with potentially negative consequences. Little is presently known about the correlates of post-colposcopy distress. The present study aimed to extend knowledge of correlates of post-colposcopy anxiety and negative affect, and identify women at risk for elevated psychological distress.

Methods: Psychosocial data (demographic variables, anxiety, negative affect, pain) were collected using validated questionnaires from 164 women attending colposcopy for the first time immediately prior to their colposcopy examination and immediately following it. Two separate logistic regressions were conducted to identify key factors that may be useful targets for preventing post-colposcopy distress and to determine which factors exert the biggest influence and therefore may be targeted in future intervention studies.

Results: Pre-colposcopy state anxiety, pain experienced during colposcopy, and trait anxiety emerged as independent predictors of post-colposcopy state anxiety, accounting for 36% of the variance. Pre-colposcopy negative affect, pain experienced during colposcopy, trait anxiety and referral smear grade were independent predictors of post-colposcopy negative affect, explaining 32% of variance.

Conclusions: Whether or not women underwent punch biopsy or treatment did not influence post-colposcopy distress levels, however, pain experienced during colposcopy remains a risk for continued psychological distress. Trait anxiety may be an important variable to consider in future studies, as women high in trait anxiety may represent a particularly vulnerable subgroup of women referred for colposcopy, at greater risk for negative psychosocial consequences associated with colposcopy and to be targeted for interventions to reduce psychological distress.

Introduction

Cervical cancer is the third most common cancer in women worldwide, and each year approximately 275 100 women die from the disease [1]. In 2008, there were 529 800 new cases globally [1]. Cervical cancer screening programmes help in reducing the incidence and mortality of this disease [2-4]. The aim of cervical cancer screening is to detect and treat squamous cell carcinoma before it progresses into invasive disease. Cytological screening by smear test allows for early detection of pre-cancerous lesions and treatment, which may stop the progression from cervical intraepithelial neoplasia (CIN) to invasive cervical cancer.

Receipt of an abnormal cervical smear test is generally followed by referral for colposcopy, a diagnostic technique that allows for in-situ examination of the cervix. Referral for colposcopy is associated with significant distress and heightened state anxiety [5-7]. The underlying reason for pre-colposcopy anxiety appears to be fear, including fear of the colposcopy examination itself [6, 8, 9], expectations of pain [10], and fear of cancer [7, 11, 12]. Other correlates of pre-colposcopy state anxiety include being single, having children, trait anxiety [10], depression, receiving a referral letter citing 'some changes' (relative to citing 'light changes' in the referral letter) [13], perception of long waiting time and dissatisfaction with pre-colposcopy information (Bekkers et al.,2002).

While the majority of women exhibit reduced anxiety following colposcopy (e.g., Hellsten et al., 2007), there still remains a large proportion of women who continue to experience elevated anxiety for a prolonged period of time following the colposcopy examination [14-16]. Elevated anxiety and its consequences may reduce adherence to screening procedures and adequate follow-up treatment for abnormal smear test results [17], and may also influence the disease process [18, 19]. It is, therefore, of critical importance to identify and treat women at risk for prolonged heightened anxiety following colposcopy. However, few studies have considered the identification of women at increased risk for

heightened post-colposcopy anxiety, and consequently, much less are known about the correlates of post-colposcopy psychological distress. One study of 342 women assessed shortly after colposcopy revealed that emotion-focused coping, negative life events, and lack of social support were associated with greater mood disturbance [20]. However, although this study assessed outcomes immediately post-colposcopy, general psychosocial correlates of distress were measured, not specific to the colposcopy examination, which may provide different relationships. A recent study of 728 women with low-grade abnormal cervical cytology assessed predictors of significant post-colposcopy distress six weeks after their last colposcopy-related procedure [21]. Analyses were stratified according to colposcopic impression and revealed that pre-colposcopy state anxiety levels, and pain or discharge following colposcopy were associated with distress at six weeks in both groups. In women with a normal transformation zone (TZ) post-colposcopy distress was also associated with worries about having sex and dissatisfaction with support. In women with an abnormal TZ, post-colposcopy distress was also associated with younger age, histology results, pain, bleeding or discharge following colposcopy, and worries about having cancer.

Due to the small number of studies which have examined the risk factors for post-colposcopy distress, further research is required to identify associated variables. Elucidation of the variables that contribute to post-colposcopy distress would have important theoretical and treatment implications for women undergoing cervical cancer screening, including the possibility of being able to identify particularly vulnerable women at risk of distress. Second, identifying variables that predict anxiety in relation to colposcopy can assist in the development of more effective strategies to reduce psychological distress. The data presented here were collected as part of a larger intervention study designed to reduce pain and anxiety in colposcopy [22, 23]. As no differences were found in self-reported pain, anxiety, or negative affect between women in the different intervention (active distraction, audiovisual

distraction or viewing the colposcopy monitor) or control groups, the data presented here have been collapsed across group membership. The current analyses were conducted to identify key factors that may be useful targets for preventing post-colposcopy distress and to determine which factors exert the biggest influence and therefore may be targeted in future intervention studies.

Methods

Participants

Participants were 164 women (*M* age = 30.20 years, *SD* = 8.66) recruited from a colposcopy clinic at a university teaching hospital in Ireland as part of a larger study assessing intraprocedural interventions. All women were first-time colposcopy patients at the time of the study enrollment, having been referred through the National Cervical Screening Program with an abnormal cervical smear result. All women were free of severe co-morbid disease, thus the sample contained women of similar health status. All women approached volunteered to participate in the study.

Design

This study employed a prospective design, with women assessed in the clinic approximately 30 minutes before the colposcopy and again immediately following colposcopy. All procedures were reviewed and approved by the local University Teaching Hospitals ethics committee.

Measures

Demographic information

The background self-report information included age, marital status, and parity. Colposcopy staff recorded referral smear grade and whether punch biopsy and/or large loop excision of the transformation zone (LLETZ) treatment occurred during the colposcopy examination.

State-Trait Anxiety Inventory (STAI)

The STAI [24] was used to assess pre- and post-colposcopy state anxiety, and trait anxiety (assessed at pre-colposcopy only). Both the state and trait measure consists of 20 statements, which assess the frequency of the respondents' feelings on four-point scales. The State Anxiety Inventory examines feelings 'at the present moment', while the Trait Anxiety Inventory assesses feelings 'in general'. The possible range of scores for each scale is between 20 and 80, with a higher score indicating greater anxiety levels. Satisfactory reliability and validity have been established [24]. In the present sample, Cronbach's alpha was .93 for the state form at T1, and .92 at T2, and .89 for the trait form.

The Positive and Negative Affect Schedule (PANAS)

The PANAS [25] was administered to assess patients' mood before and after the colposcopy examination. It consists of 20 adjectives rated on a five-point scale from 'very slightly, or not at all' to 'extremely' and measures state dimensions of positive and negative affectivity, by asking patients to rate "the extent to which they feel this way right now, that is, at the present moment. The positive affect (PA) score equals the total of the positive mood adjectives, and the negative affect (NA) score equals the total of the negative mood adjectives. Scores range from 10 to 50 on both scales, with a higher score indicating greater positive or negative affectivity. Reliability and validity have been established [25]. For the purposes of the present analysis, only the NA scale was used. In the present sample, Cronbach's alpha was .84 for NA at T1 and .98 at T2.

Pain experienced during colposcopy

Pain experienced during colposcopy was assessed using two 100-mm visual analogue scales (VAS), to allow for a thorough assessment of both the intensity and unpleasantness of the experienced pain. The pain intensity VAS was anchored by 'no pain' and by 'pain as bad as it could be' at either end. The pain unpleasantness VAS was anchored by 'no discomfort' and 'worst discomfort' at either end. VASs are scored by measuring the distance (in mm) from the 'no pain' anchor to the respondent's mark, with a higher score indicating a greater pain intensity or unpleasantness. VASs with extreme anchors and of sufficient length ($\geq$ 10cm) have been shown to have the greatest sensitivity and are the least vulnerable to distortions [26]. Test-retest reliability of VASs measuring pain intensity and pain-related affect are high (r = .90, and r = .70-.90, respectively)[26] and VASs have also been shown to correlate highly with other pain rating scales [27, 28]. A mean experienced pain score was calculated on the basis of the intensity and unpleasantness scores and used in the present analyses.

Coping Behaviours Inventory

This 24-item coping scale was based on the Coping Strategies Questionnaire [29], and measured four types of active coping behaviours: diverting attention, reinterpreting sensations, ignoring sensations, and coping self-statements. It was administered to examine the spontaneous coping strategies women used during the colposcopy examinations. Cronbach's alpha for diverting attention was .83, for reinterpretation .64, for ignoring .56, and for coping self-statements it was .65. A total active coping score was created and used in the present analyses.

Procedure

Procedures have been described in detail elsewhere [10, 22, 23]. On arrival at the colposcopy clinic, and following the initial interview by a nurse, women were requested to wait in a designated waiting area. Women were invited to take part in the study by the researcher and presented with study information and written consent was obtained. Prior to the colposcopy examination, each woman was administered the study questionnaires and individually responded to them in a quiet office with the researcher present to answer any questions. All women were examined by the same colposcopist. Immediately following the colposcopy examination, women were administered the post-colposcopy questionnaire.

Statistical analyses

Two multiple regression analyses were conducted, with post-colposcopy state anxiety and negative affect as the dependent variables in their respective models. Sociodemographic variables were entered, followed by pre-colposcopy anxiety, mood, and trait anxiety, and colposcopy-related variables (referral smear grade, and whether the woman underwent biopsy and/or LLETZ treatment), active coping and self-reported pain experienced during the colposcopy examination.

Results

Descriptive statistics

The majority of women were single and nearly half had children. Half the women underwent a biopsy during their colposcopy examination, and just over one-fifth underwent see-and-treat LLETZ treatment. Women's anxiety scores at pre-colposcopy were very high, and the mean score of 45.09 (SD = 12.00) represents the 81st percentile in normal female adults aged 19-49 years [24]. On the other hand, the mean post-colposcopy state anxiety score (36.64, SD =

10.26) was similar to the normative mean score for female adults (35.20, SD = 10.61) reported by Spielberger et al [24]. The mean pre-colposcopy negative affect score (mean 17.98, SD = 6.17) is equivalent to the 74th percentile, while the mean post-colposcopy negative affect score (mean = 13.81, SD = 4.79) represents the 47th percentile [30]. Please see Table 1 for a summary of descriptive data.

Outcomes by colposcopic assessment

Women followed different management pathways depending on colposcopic impression, and within the sample 80 women (51.2%) underwent punch biopsy during colposcopy and 35 women (21.3%) underwent LLETZ treatment. There were no significant differences in self-reported pain between women who underwent punch biopsy (M = 25.49, SD = 20.31) and those who did not (M = 24.79, SD = 21.19; t(162) = .22, p = .83). There were also no significant differences in self-reported pain between women who received LLETZ treatment (M = 28.89, SD = 18.95) and those who did not (M = 24.11, SD = 21.11; t(162) = 1.21, p = .23).

Predicting post-colposcopy state anxiety

The model was statistically significant (F(10, 153) = 10.11, p < .001) and accounted for 36% of variance in post-colposcopy state anxiety (R^2 = .40). Self-reported pain was the strongest predictor of post-colposcopy state anxiety (β =.34), followed by pre-colposcopy state anxiety (β =.27), and trait anxiety (β =.25).

Predicting post-colposcopy negative affect

The model was statistically significant (F(10, 153) = 8.78, p < .001) and accounted for 32% of variance in post-colposcopy negative affect (R^2 = .37). Pre-colposcopy negative affect was

the strongest predictor of post-colposcopy negative affect (β =.27), followed by self-reported pain (β =.26), trait anxiety (β =.23), and colposcopy impression (β =.21).

Discussion

The present study was designed to elucidate potential predictors of post-colposcopy distress using a prospective design, where women who underwent colposcopy were assessed immediately prior to their first ever colposcopy and again immediately following it. The results show that post-colposcopy distress is predicted by pain experienced during colposcopy, pre-colposcopy distress levels, trait anxiety and severity of colposcopic impression.

In this study, self-reported pain emerged as the strongest independent predictor of post-colposcopy state anxiety and the second strongest predictor of post-colposcopy negative affect. This was independent of the type of treatment women received during the colposcopy examination. Within the sample there were no significant differences in self-reported pain between women who underwent punch biopsy and those who did not. There were also no significant differences in self-reported pain between women who received LLETZ treatment and those who did not. Pain experienced during colposcopy may negatively influence decisions to return for recommended follow-up treatment [31], although within this sample of women we found that pain during colposcopy did not influence adherence to follow-up colposcopy [32]. Nevertheless, other studies have found that colposcopy-related pain appears to influence post-colposcopy distress levels not only immediately after it, but also at six weeks after the examination [21], so further research about colposcopy pain is warranted.

Whether or not a woman underwent punch biopsy and/or see-and-treat LLETZ treatment did not influence their post-colposcopy distress levels. This is in line with previous research using a retrospective survey design, where we found no significant differences in

self-reported anxiety or worry in women who underwent colposcopy with or without LLETZ treatment [7]. Sharp et al. (2013) also reported similar levels of distress in women who underwent see-and-treat LLETZ and women who underwent punch biopsy. Similarly, Balasubramani et al. [33] found that women who underwent see-and-treat LLETZ reported significantly less anxiety one week post-treatment than women who underwent defer-and-treat colposcopy. Taken together, these results suggest there may be psychological benefits with see-and-treat LLETZ treatment, as well as resource savings and financial benefits.

Severity of colposcopic impression was found to be an independent predictor of post-colposcopy negative affect. This is similar to results obtained by Sharp et al. (2013), where women with CIN2/3 were found to be at greater risk for post-colposcopy distress at six weeks than women with lower grades of cervical abnormality. These women appear to be particularly vulnerable and at risk for psychological distress, and at greater risk of defaulting from follow-up recommendations for treatment [32]. The reasons for these findings are currently unclear, so further research is warranted to identify the underlying mechanisms and also to design effective interventions to reduce the psychological distress associated with CIN2/3 diagnoses.

Pre-colposcopy levels of state anxiety and negative affect emerged as independent predictors of post-colposcopy levels. These results are similar to those of Sharp et al. (2013). It suggests that women's anxiety levels before colposcopy have a significant influence on their post-colposcopy levels, not just in the immediate aftermath, but also longer term. Consequently there is a need for further research relating to interventions to reduce anxiety and distress prior to colposcopy examinations, which could serve to reduce the overall duration of experienced psychological distress for women referred for colposcopy. We have previously identified high trait anxious women as possibly representing a particularly vulnerable subgroup of women in colposcopy [10]. Individuals high in trait anxiety are prone

to respond to anxiety-provoking situations with elevations in state anxiety [24], and trait anxiety emerged as an independent predictor of pre-colposcopy state anxiety and negative affect in our analyses [10]. Trait anxiety also emerged as an independent predictor in post-colposcopy distress in these analyses for both state anxiety and negative affect. A brief measure of trait anxiety may prove a simple, yet effective way of identifying women at risk for high distress associated with colposcopy, although further empirical evidence is required.

In these analyses, active coping style did not influence post-colposcopy distress, and we also had little success in our intra-procedural interventions aimed at reducing pain and anxiety during colposcopy [22, 23]. Mixed results have been reported from other studies assessing interventions during colposcopy, with some finding support for the use of music [34], while others have not [35], or viewing the colposcopy monitor [36], although contrary findings have been reported [37]. Perhaps what this indicates is that it makes little difference to women's psychological distress what happens *during* colposcopy, and intervention efforts may be better placed *before* attending for colposcopy and directed at changing attitudes, knowledge, and distress before the colposcopy appointment. However, these results also suggest that women may require additional support following colposcopy, particularly relating to colposcopic impression and/or histology results.

The following limitations should be noted. Although the use of self-report questionnaires is important in assessing patients' experiences of colposcopy, it introduces the possibility of biases, including consistency bias, demand characteristics, and social desirability biases. However, participants were assessed using standardised, validated measures with known psychometric properties, which minimises possible biases. In addition, women were assured their responses were anonymous and told there were no right or wrong answers, which serves to minimise the possibility of evaluation apprehension, social desirability and consistency biases. Furthermore, coping was measured using a self-report

questionnaire and the internal consistency level for three of the subscales fell somewhat short of the .70 acceptable level. This suggests the subscales may not be unidimensional, and future studies may well choose to use a different measure of coping. In addition, the results are limited to the variables included in the study, and there may be other variables not assessed in this study that may be important determinants of post-colposcopy distress. All participants were recruited from a single colposcopy clinic, potentially limiting generalizability. Nevertheless, the socio-demographic profile of women was similar to those reported in other studies [38].

The strengths of the study include its prospective design, the recruitment of women with no prior experience of colposcopy examinations or treatment for CIN, with all colposcopies performed by one colposcopist, minimizing differences in experience.

In summary, the results from these analyses indicate that, with the exception of pain, experiences during colposcopy are not good predictors of post-colposcopy psychological distress. Post-colposcopy psychological distress is predicted by self-reported pain, pre-colposcopy levels of distress, trait anxiety and referral smear grade. Trait anxiety may be an important variable to consider in future studies, as women high in trait anxiety may represent a particularly vulnerable subgroup of women referred for colposcopy. Effective methods for reducing anticipatory anxiety and distress in women referred for colposcopy should be identified to minimise distress.

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Table 1. Descriptive statistics for sample (N = 164)

Variable	**N (%)**	**Mean (SD)**	**Range min-max**
Age		30.20 (8.66)	
Married	62 (37.8)		
Children	83 (50.6)		
Referral smear grade			
Normal	44 (26.8)		
Mild	63 (38.4)		
Moderate	24 (14.6)		
Severe	33 (20.1)		
Biopsy	80 (51.2)		
LLETZ treatment	35 (21.3)		
State anxiety T1		45.09 (12.00)	20-80
State anxiety T2		34.64 (10.26)	20-57
Trait anxiety		35.89 (8.15)	20-63
Negative affect T1		17.98 (6.17)	10-37
Negative affect T2		13.81 (4.79)	10-34
Colposcopy pain		25.13 (20.70)	0-95
Active coping		9.40 (4.96)	0-22

Table 2. Multiple regression analysis results for correlates of post-colposcopy state anxiety

	Adj. R^2	β	B	SE	CI 95% (B)
Model	.36***				
Age		.05	.06	.09	-.13 / .24
Married		.02	.42	1.59	-2.73 / 3.56
Children		-.12	-2.49	1.59	-5.63 / .66
T1 state anxiety		.27***	.23	.06	.12 / .34
Trait anxiety		.25***	.31	.08	.14/ .48
Referral smear grade		.15	1.40	.90	-.37 / 3.17
Biopsy		.03	.68	2.54	-4.33 / 5.69
LLETZ		-.01	-.25	2.69	-5.57 / 5.08
Active coping		-.08	-.16	.13	-.12 / .34
Pain		.34***	.17	.03	.10 / .23

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 3. Multiple regression analysis results for correlates of post-colposcopy negative affect

	Adj. R^2	β	B	SE	CI 95% (B)
Model	.32***				
Age		.07	.04	.04	-.05 / .13
Married		-.08	-.80	.77	-2.32 / .71
Children		-.01	-.04	.96	-1.55 / 1.48
T1 negative affect		.27***	.21	.05	.10 / .32
Trait anxiety		.23**	.14	.04	.06 / .22
Referral smear grade		.21*	.95	.43	.10 / 1.80
Biopsy		-.01	-.11	.74	-1.59 / 1.36
LLETZ		.02	.24	1.21	-2.16 / 2.63
Active coping		-.11	-.11	.06	-.23 / .02
Pain		.26***	.06	.02	.03 / .09

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$