

Exploring women’s sensory experiences of undergoing colposcopy and related procedures: implications for preparatory sensory information provision

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Abstract

Introduction: Some women experience distress during colposcopy examinations which is partly related to women's fear, or experience, of pain during the procedure. However, little is known about women's sensory experiences of colposcopy (other than pain) or what might impact on these experiences. The aim of this study was to explore women's sensory experiences of colposcopy and related procedures and identify factors which influenced negative sensory experiences.

Methods: In-depth interviews were conducted with 23 women who had undergone, for the first time, a colposcopy (some with related procedures, including punch biopsies and loop excision) as part of follow-up for abnormal cervical cytology. Interviews were analysed thematically using the Framework Approach to organise the data and identify emerging higher-order themes.

Results: Women described a range of sensory experiences including pain or discomfort, cramping, stinging and cold sensations (due to the application of acetic acid to the cervix). Four key themes emerged as important aspects of the overall sensory experience: levels of pain, treatment-specific sensations, anaesthetic-specific sensations and solution-specific sensations. Factors that may influence women having a negative sensory experience were: sensory expectations of the procedure(s) and lack of preparatory sensory information.

Discussion: Our study provides unique in-depth insight into women's sensory experiences of colposcopy and related procedures and suggests women require more preparatory sensory information. The issues identified as contributing to women having a negative sensory experience may help inform the development of pre-colposcopy information which may better prepare women with abnormal cervical cytology for follow-up examinations.

Introduction

Each year, thousands of women who take part in cervical screening require follow-up investigations for abnormal results. One of the most widely used follow-up methods is a colposcopy examination. In England alone, approximately 200,000 women are referred for colposcopy annually [1]. The appointment may include punch biopsies for the confirmation of presence or absence of cervical intraepithelial neoplasia (CIN) (and subsequent recall of women for treatment if required) or immediate removal of these areas by loop excision [2].

Undergoing colposcopy can be distressing for women. Studies have found elevated anxiety levels before and during the procedure. High anxiety may be partly attributed to uncertainty about what is going to happen at the colposcopy appointment and what the procedure entails [3]. It may also be explained by women's fear, or experience, of pain during the procedure [4,5]. There is now evidence that some women experience distress afterwards which sometimes persists longer term [6] and some suggestions that post-colposcopy psychological wellbeing is affected by the colposcopy experience. For example, in one study, women who described their colposcopy as particularly painful were more likely to experience short-term distress following the procedure [5].

A study of women's colposcopy information needs found that questions about the sensations experienced during the examination were among the most common [7]. Research on other potentially painful procedures (e.g. endoscopy, dental extraction) suggests that preparatory sensory information (delivered in combination with procedural information) can be effective in reducing the experience of pain [8]. In order to develop appropriate preparatory sensory information for colposcopy and related procedures, a clearer understanding of women's sensory experiences is needed.

The limited quantitative studies available suggest many women experience pain or discomfort, some at high levels, during colposcopy and/or related procedures [9-12]. However, beyond reports of pain, there has been little research on the sensory experiences of colposcopy or on what might contribute to women's sensory experiences [13,14]. Although qualitative methods can be a valuable tool for understanding people's real-life encounters of medical investigations, only one study, published in 1996, used qualitative methods to investigate women's sensory experiences of colposcopy [14]. However, this study involved prompting women with cue cards outlining potential sensations, so may not have captured all the sensations women actually experienced. A recent quantitative study found women reported more sensations with more intensive management of their abnormal cytology [13]. Beyond this, no studies appear to have explored what influences women's sensory experiences.

With these issues in mind, we conducted in-depth qualitative interviews with women who had undergone colposcopy and related procedures. In this analysis, we explored: (1) the range of sensory experiences women have during colposcopy and related procedures and (2) factors which influenced women's negative sensory experiences of these procedures.

Methods

The aim of this secondary analysis was to investigate women's sensory experiences undergoing colposcopy. In our larger study, we initially intended to investigate psychological distress following colposcopy. However, women's sensory experiences emerged during interviews as an important issue for women and, as such, merited further examination.

Therefore, the analysis and results presented here relate only to those sensory aspects of the data; the findings relating to psychological distress are reported elsewhere [5].

Study setting

The study took place in Ireland in 2013. A national cervical cancer screening programme (CervicalCheck) was introduced in 2008, offering free cervical cytology tests to women aged 25-60 years. Women with abnormal cytology results (two consecutive low-grade results or one high-grade result) are referred for colposcopy in a CervicalCheck affiliated clinic [2].

During the examination, acetic acid (a dilute vinegar solution) is first applied to the cervix followed by Lugol's Iodine solution. The application of these liquids allows the colposcopist to identify abnormal areas on the cervical transformation zone [15]. If areas appear abnormal, a biopsy is performed (one or more punch biopsies or small loop biopsies), to confirm the colposcopic diagnosis. Some women require treatment to remove cervical abnormalities (CIN). These women will either be treated immediately with a large loop excision of the transformation zone (LLETZ), or will be recalled for treatment at another appointment.

Women receive local anaesthetic (in the form of an injection) prior to treatment [15]. Women may also be offered a local anaesthetic injection for diagnostic punch biopsies, but this practice is variable.

Participant sampling, eligibility and recruitment

Women who had attended two CervicalCheck-affiliated colposcopy clinics and had previously participated in a psychological wellbeing study, involving completion of questionnaires 4, 8 and 12 months post-colposcopy [4], comprised the sampling frame for this study. To be eligible, women had to have been referred for colposcopy with either a low- or a high-grade abnormal cytology result, not have had another colposcopy prior to recruitment to the quantitative study, and have completed at least one psychological questionnaire in the quantitative study. Clinical data (initial colposcopy and histology results) were obtained from the women's colposcopy clinic records.

A total of 144 women were purposively sampled based on questionnaire responses for heterogeneity in marital status and psychological wellbeing and sent a letter inviting them to take part in an interview. Interested women (n = 31) returned a reply slip to the research team, and the interviewer contacted them to arrange the interview. All participants provided written informed consent before interview. Ethical approval was provided by the research ethics committee for each participating hospital.

Procedures

In-depth, face-to-face interviews were carried out between January and June 2013 at the participants' homes. Interviews lasted 25–70 minutes and were audio-recorded with the participants' consent. Interviews were guided by a semi-structured topic guide (Appendix 1). Women were asked about their socio-demographic characteristics; experiences of colposcopy and related procedures, including how they felt emotionally before, during and after the procedure(s); and whether or not they had had any physical after-effects (such as pain). The discussion with each woman was different and allowed to evolve organically; specific questions asked and probes used varied from woman to woman. Interviews ceased once data saturation was reached (i.e. no new issues arose from the data [16]); this was achieved once 23 interviews had been conducted.

Analysis

Data collection and analysis were concurrent. Interviews were transcribed verbatim and anonymised. The interviewer and another researcher independently reviewed and coded transcripts of the first two interviews, discussed these to reach consensus, and combined codes into initial themes. These codes were then applied to the remaining interviews, with code lists refined as analysis progressed. Thematic analysis was then undertaken [17]. The Framework Approach was used to organise the data and identify emerging higher-order themes relating to sensory experiences [18]. This involved the development of a matrix, with themes or subthemes comprising the columns, and participants the rows. Data were summarised within the matrix to facilitate systematic organisation of the data and examination of themes and cases. Analysis involved close inspection of the data in the framework by theme and by participant. The various sensory aspects of women's experiences were identified. To seek explanations for negative sensory experiences, factors that

influenced sensory experiences were then identified; for this part of the analysis we included women (n = 9) who reported a particularly painful or uncomfortable experience or who reported another sensory experience which had impacted on them.

Direct quotes that illustrate participants' narratives are included throughout the results section. Each quote is followed by the relevant participant ID number and type of management women reported receiving.

Results

Characteristics of participants

The socio-demographic and clinical characteristics of the 23 participants are summarised in Table 1.

Sensory experiences of undergoing colposcopy +/- related procedures

Figure 1 shows the range of sensory experiences described by women while they were undergoing colposcopy and related procedures. In addition to pain, women described various other sensations that they attributed to the colposcopy, punch biopsies, loop excision, anaesthetic injections, or application of the solutions to visualise the cervix (acetic acid/Lugol's Iodine).

Four themes were identified relating to women's sensory experiences: (1) Levels of pain, (2) Treatment-specific sensations, (3) Anaesthetic-specific sensations, and (4) Solution-specific sensations.

Levels of pain

Women experienced varying degrees of pain during the procedures. Some found their procedure neither painful nor uncomfortable; others described the colposcopy (and biopsies) as 'uncomfortable' or 'unpleasant' but not painful. However, other women found the procedure(s) very painful. For example, one woman reported:

I found it really painful and really uncomfortable, even though I was a little bit anxious about it, I did find it really painful and it's not something I wanted to repeat again afterwards. (Colposcopy + biopsies, INT N150)

Some of the women who did not find the colposcopy itself painful described feeling considerable pain or discomfort when having biopsies taken. However, most women recalled that biopsies were taken quickly:

They did the colposcopy that day which was fine, then they took the biopsy, it hurt like mad, I think I let a yelp out and I remember thinking oh my God, like, that really hurt but she was taking some tissue samples and, like, it wasn't there long or anything.

(Colposcopy + biopsies, INT N148)

A few women described feeling cramping sensations at the time of their biopsies; one compared these to a 'bad labour pain'.

Treatment-specific sensations

Women who underwent treatment (loop excision) described sensations (other than pain) that were specific to the procedure. For example, one woman smelt burning. Another woman who had a particularly painful experience described 'a horrible scraping feeling':

I think she gave me an injection [anaesthetic], you know, for the pain. I remember that scraping feeling that, just that horrible scraping feeling and it hurting me.

(Colposcopy + loop excision, N104)

Anaesthetic-specific sensations

Most women who had received a local anaesthetic acknowledged that it had numbed pain, and some noted that they did not feel anything after having the injection. However, others described various sensory effects the anaesthetic had on them. One woman described how her body started to shake after receiving the anaesthetic.

A few women described feeling dizzy or lightheaded after receiving the anaesthetic:

I do remember feeling fairly like all of a sudden I got this feeling over me where I literally felt like, I could feel myself going white, a kind of a draining feeling and a bit lightheaded. (Colposcopy + biopsies, INT N259)

Other women felt their heart beat faster; one described how this sensation felt strange but she was made aware by the clinic staff that this could happen:

They warned me about it, that it [local anaesthetic] makes your heart beat faster, but it felt very odd and if they hadn't warned me about that I think I would have freaked out about it because my heart did beat pretty fast and it was strange. (Colposcopy + biopsies, INT N099)

Solution/-specific sensations

Some women described how it felt for them when the solutions (acetic acid/Lugol's Iodine) were being applied to the cervix. For example, one woman who had treatment performed during the colposcopy appointment felt a stinging sensation when the acetic acid was being applied:

It's [acetic acid application] a bit akin I suppose to putting lemon juice on an oyster, sort of, it makes things react. And that didn't hurt, it did sting a bit though. (Colposcopy + loop excision, INT N194)

Some women described feeling a cold sensation. For example, one woman recalled that it felt cold when the acetic acid was sprayed onto her cervix but that this did not bother her as her procedure was over quickly.

Factors influencing women's negative sensory experiences

Among the women who had some negative sensory experience, this appeared related to: (1) Sensory expectations and (2) Lack of preparatory sensory information. The two factors were inter-related, but are described separately below. In general, having biopsies or treatment did not appear to influence women's sensory experience. However, for some women, the treatment (loop excision) was the most painful aspect of the procedure.

Sensory expectations

Expectations that the colposcopy would be similar to a cytology test were related to having a negative sensory experience. For example, one woman said that she had anticipated that the colposcopy would be 'no more uncomfortable than a smear [cytology test]' but actually found it much more painful:

I found it really painful and really uncomfortable. I was surprised because I think, I was expecting something similar enough to a smear test. (Colposcopy + biopsies, INT N163)

Women's expectations of pain varied. Some expected their colposcopy (or related procedure) to hurt more than it actually had. For others, the colposcopy (and/or related procedure) was more painful than expected. Most women who found their procedure particularly painful had not expected it to hurt as much as it had, even when they had anticipated some pain. For example, one woman described how she had 'psyched herself up' for her colposcopy examination to be a little sore, but found it more painful than she had anticipated.

Other women spoke about the colposcopy being more "intrusive" than a cytology test. One of these women said:

As I said, I was used to the smears at that stage so I assumed that's what it was going to be like. I didn't know it was going to be a more intrusive procedure.....It was very uncomfortable. (Colposcopy + biopsies, INT N223)

One woman had expected her colposcopy to be more 'invasive' than the cytology test and found it to be so.

In contrast, women who had expected the colposcopy to be more painful or to feel 'worse' than a cytology test often did not find it especially painful. Similarly, women who had prepared themselves for the colposcopy 'to be an unpleasant procedure' did not find it particularly painful. One woman reported:

.... I was so het up about the possibility that this colposcopy was going to be seriously physically unpleasant for me...but.... the procedure itself is not very problematic, it wasn't frightening or painful. It was uncomfortable but it wasn't painful. (Colposcopy + loop excision, INT N194)

Lack of preparatory sensory information

Related to women's expectations about how the procedure would feel was the extent to which they had been provided with pre-colposcopy sensory information. Women differed in terms of preferences for preparatory sensory information; most women wanted more, but a few felt they had been given enough.

However, a lack of pre-colposcopy information on the sensory aspects of the procedure was linked with unrealistic sensory expectations, and negative sensory experiences of the procedure. Most women felt they would have been better prepared for their procedures if they had known they may experience some degree of pain. In particular, women expressed how they would have liked more verbal 'warning' from the clinician or nurse that taking their

biopsies may hurt. Some women who received anaesthetic injections reported that they were not told how the anaesthetic could impact on them. For example, one woman described how she would have liked some time prior to her procedure to receive verbal information about the procedure and the potential impact of the anaesthetic:

I would really have liked to have been brought in beforehand and explained exactly what was going to happen, not just before somebody sticks an injection into your cervix and say, "oh now, you might get a little bit of trembling." I remember my whole body, my legs [shaking]. (Colposcopy + loop excision, INT N105)

Some other women felt that the information provided did not correspond with the actual sensory experience. For example, one woman stated that she was told she would feel a warm sensation when having her treatment but noted that she got a shock when the procedure was being performed as it felt like air being applied to the cervix rather than heat:

*She [nurse colposcopist] said there'd be, like, heat or something, it just felt completely different to how I had thought it was going to feel. So I got a **BIG SHOCK** when she, when she did whatever she did and I jumped about five foot in the air! (Colposcopy + loop excision, INT N033)*

Discussion

The aim of this secondary analysis was to better understand women's sensory experiences in order to inform the development of strategies to prepare women for all sensory aspects of colposcopy and related procedures, in the hope that such an intervention could help alleviate pain and distress associated with colposcopy.

This is the first qualitative study to report in detail the sensory experiences women feel while undergoing colposcopy and related procedures, and identify factors which may influence whether women have negative sensory experiences of these procedures. In addition to pain and discomfort, women described sensations that were quite specific to biopsies, treatment and application of anaesthetic and solutions. Some women had negative sensory experiences of their procedures and this appeared to be related to their expectations and the information they had received beforehand. A lack of preparatory information on sensory aspects of the procedures led to a 'mismatch' between women's sensory expectations and their actual experiences.

While it is recognised that colposcopy and related procedures are potentially painful [19,11], there was a significant gap in the evidence-base on sensory experiences specifically related to biopsies. Our analysis has filled that gap. While some women in our study did not experience pain during the colposcopy itself, they did experience considerable pain or discomfort while biopsies were being taken. Women also described feeling cramping sensations that were specific to biopsies. Current colposcopy-related information in the UK and Ireland provides very brief information on biopsies and how these may feel. These materials state that when the biopsies are being taken, women may feel a 'pinch' or they may feel a 'slight stinging sensation but taking the biopsy should not be painful' [20,21]. Our study suggests that this information may be inadequate for women to feel prepared for their biopsies. The fact that

biopsies are usually taken quickly helped some women in our study with their pain experiences and suggests that this information could usefully be included in information materials.

Our study also provides, for the first time, insight into women's sensory experiences related to anaesthetic application. Although for most women the anaesthetic served to numb pain and any other sensations, a few women described physical impacts of the anaesthetic, which were sometimes unexpected. Existing information materials do not provide information on how women may feel during the anaesthetic injections (and how it may impact on their bodies), and our findings suggest that such information might be added.

Expectations that the colposcopy would be similar to a cytology test, and low pain expectations, contributed to some women having negative sensory experiences and these two factors appeared to be interrelated. In contrast to our findings, a survey study in women undergoing colposcopy found that pre-colposcopy pain expectancy was positively associated with colposcopy-related sensory and affective pain [10]. The apparently different findings may be a result of different information being ascertained in different ways in the two studies. Our findings suggest that the likelihood of experiencing some pain during colposcopy (and biopsies) should not be 'downplayed' to women when counselling them as it could negatively impact on their (sensory) experience of the procedure. More accurate expectations of the sensory aspects of the colposcopy may help women have a better sensory experience of the procedure and this is likely to be best achieved by the provision of appropriate information.

Our findings are largely consistent with the results of a focus group study that found women wanted more detailed information about the colposcopy procedure [4]. In that study, women felt that the distress they experienced prior to colposcopy was as a result of unsatisfactory explanations of the colposcopy procedure. However, this study did not consider sensory

information: our study has extended these findings by showing that the lack of preparatory information on how the procedures may feel was related to women having unrealistic sensory expectations and a negative sensory experience of their procedures. This may, in turn, lead to distress during the procedure and short-term distress afterwards.

Anxiety levels and perceptions of pain are undoubtedly inter-related - pain is almost always accompanied by emotional distress [22] and anxiety can heighten perceived pain intensity [23]. In the specific context of colposcopy, there is some evidence to suggest that that state anxiety and pain perception during the procedure are correlated [24]. Interestingly, in our study, although we asked women about how they had felt emotionally before and during the colposcopy, our analyses did not find that women's emotional state influenced whether or not they had a negative sensory experience. However, the number of women who had negative sensory experiences was limited, and we did find that women who had a negative physical experience of colposcopy more often than not experienced distress afterwards [5]. Further research to explore the complex inter-relationships between psychological wellbeing and women's (sensory) experiences of colposcopy is warranted.

Some limitations of this study should be acknowledged. Participants were recruited from just two clinics, but were diverse in terms of their socio-demographic characteristics and colposcopy results. The study was not specifically designed to explore sensory experiences of colposcopy as noted in the methods section. As such, this may have limited the extent to which this issue was explored in-depth in all of the interviews. In addition, as is the case in other qualitative studies, the relative weight or importance of themes and subthemes is not clear. However, the credibility of the process, including the sampling, is evidenced in the diverse opinions and responses expressed in the interviews, suggesting the themes identified will be transferrable to other settings.

Implications

Some interventions aimed at reducing women's anxiety during colposcopy have been trialled, with limited efficacy [3]. Specifically, although information leaflets prior to colposcopy increase women's knowledge levels, they do not reduce anxiety levels pre-colposcopy [3,25]. However, it is not clear whether any of these information leaflets contained detailed sensory information. In other settings a combination of sensory and procedural preparatory information prior to medical procedures is beneficial in reducing pain and distress associated with these procedures [26]. The findings of the current study suggest that it would be worth evaluating the efficacy of combined sensory and procedural information on levels of pain and anxiety during colposcopy and related procedures.

Conclusions

This study has, for the first time, described in detail the entire sensory experience of undergoing colposcopy and related procedures from the perspective of the women involved and found that women can experience a range of different sensations that are quite specific to different aspects of follow-up investigations and procedures for abnormal cervical cytology. Sensory expectations and lack of information on the procedures were related to some women experiencing negative sensory experiences.

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Declaration of interest

The authors report no conflicts of interest. This study was funded by the Health Research Board, Ireland (removed for blind review).

Current knowledge on the subject

- Undergoing colposcopy and related procedures for abnormal cervical cytology can be distressing for some women. Women can experience anxiety before, during and after the procedures.
- The negative psychological experience of colposcopy is partially related to women's fear, or experience, of pain and discomfort during the procedure.
- Beyond reports of pain, little is known about the sensory experiences of colposcopy or what might contribute to women's sensory experiences.

What this study adds

- This study provides, for the first time, in-depth insights into the entire sensory experience of undergoing colposcopy and related procedures (beyond experiences of pain or discomfort).
- A lack of preparatory information on how the procedures may feel was related to women having unrealistic sensory expectations and a negative sensory experience of their procedure.
- Addressing the factors identified in this study may help improve women's physical – and, hence, psychological – experience of colposcopy.

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Table 1. Characteristics of participants

Characteristic	Status	Number
Age	Less than 30 years	1
	30-39 years	11
	40-49 years	6
	50-59 years	4
	60 and older	1
Marital status	Married/cohabiting	16
	Single (in a relationship)	4
	Single (not in a relationship)	2
	Widowed	1
Highest level of education completed	Third level-higher	11
	Third level-lower	3
	Secondary/leaving cert	5
	Junior cert/intermediate cert	4
Children	No	9
	Yes	14
Initial colposcopy result*	Normal TZ	4
	Abnormal TZ	16
	Unsatisfactory	2
	Missing	1
Initial histology result*	No CIN or CIN 1	14
	CIN 2/3	4
	Missing, inadequate or unsatisfactory	5
Initial management received*	Colposcopy only	3
	Colposcopy plus punch biopsies	18
	Colposcopy plus Large loop excision (LLETZ)**	2

CIN, cervical intraepithelial neoplasia; LLETZ: large loop excision of the transformation zone. TZ: transformation zone.

*Information obtained from colposcopy clinic medical records.

**Initial management was that which followed the referral colposcopy and any related procedures.

During interviews, another 4 women divulged they had subsequently received treatment (i.e. they had large loop excision at some point during follow-up).

Figure 1. Sensory experiences of undergoing colposcopy +/- related procedures

