Inflammatory Bowel Disease and Sexual Function in Male and Female Patients: An Update on Evidence in the Past Ten Years

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Abstract

Background and Aims: Inflammatory bowel diseases [IBD] are a group of chronic, debilitating inflammatory intestinal conditions. The aim of this review was to assess the recent data regarding the impact of IBD in sexual function of male and female patients.

Methods: A literature search was conducted on MEDLINE using, among others, the following search terms or their combinations: ulcerative colitis; Crohn’s disease; sexual function; sexual health; relationship status; erectile dysfunction; surgery. All English-language studies published in the past 10 years which provided data evaluating the sexual function in IBD patients were included.

Results: Fourteen studies were identified; six included IBD patients registered on a national database or presented in a clinical setting, whereas eight evaluated sexual function after a surgical intervention for IBD. The majority of the studies used the validated for general populations International Index for Erectile Function [IIEF] and the Female Sexual Function Index [FSFI] for the assessment of sexual function among males and females, respectively. An impaired sexual function has been reported in general cohorts of IBD patients; females seemed to experience worse sexual dysfunction than males. Furthermore, depression was a consistent negative predictive factor across studies. Surgery did not seem to affect sexual function in the majority of studies, except a prospective one which reported a significant improvement in male sexual function [IIEF, \( p < 0.05 \)] but not female [FSFI, \( p = 0.6 \)].

Conclusions: Sexual function among IBD patients may be impaired, thus more studies are needed in order to develop the appropriate instruments and proper and effective management strategies.

Keywords: Inflammatory bowel diseases; sexual function; intercourse

1. Introduction

Inflammatory bowel disease [IBD] represents a group of idiopathic chronic inflammatory intestinal conditions; ulcerative colitis [UC] and Crohn’s disease [CD] are the two major types. The incidence of IBD in Europe ranges from 0.5 to 10.6 cases per 100,000 person-years for CD and range from 0.9 to 24.3 per 100,000 person-years for UC. The overall cumulative surgery rate after 10 years from the diagnosis in CD is high [30–50%], whereas in UC it is approximately 10%.

The level of health of patients with IBD may be impaired in several ways and many studies have shown high prevalence of severe depressive symptoms [14.9%] and a deterioration of health-related
quality of life. Almost 40 years ago Gazzard et al. reported a decreased sexual activity among patients with IBD. Worryingly, nowadays this remains an issue, since a significant proportion of patients report lack of intimate relationships due to IBD and sexual problems seem to be common [20.6%]. Despite the apparent impact of the impaired sexual function, the number of relevant studies is limited. Therefore, the aim of this study was to present the available data over the past 10 years concerning the evaluation of sexual function among males and females with IBD.

2. Material and Methods
A literature search was conducted on MEDLINE using the following search terms or their combinations: inflammatory bowel disease; ulcerative colitis; Crohn's disease; sexual function; sexual health; relationship status; erectile dysfunction; intercourse; intimacy; sexuality; body image; surgery; ileal pouch-anal anastomosis; proctectomy. The references of the retrieved studies were searched manually for the identification of additional studies. We included only English-language studies published in the past 10 years which evaluated the sexual function of males and/or females with IBD [2004-September 2014]. Studies that did not include or provide or describe separately results for IBD patients were excluded from the study. All abstracts retrieved were screened manually and selected in order to comply with the inclusion criteria and the purposes of this study. The search strategy is presented in Figure 1. From each study, information was extracted on: study design; participants [sample sizes, sex, age]; questionnaire used to estimate sexual function; and outcome measure; and was included in the appropriate tables.

3. Results
Fourteen studies were identified. Since there is not a validated questionnaire for the evaluation of the sexual function in IBD patients, most of the studies used questionnaires validated in the general population. Therefore the International Index for Erectile Function [IIEF] for males and the Female Sexual Function Index [FSFI] for females were used in the majority of the studies. The majority of the studies examined sexual function in both males and females and thus the results are not presented based on sex. Instead the results are presented based on participant selection. Thus six studies examined the sexual function among male and/or female patients with IBD registered on various national database or presented in a clinical setting, whereas eight studies included only male and/or female patients who had undergone a surgery and examined their sexual function.

![Figure 1. Flowchart of the search strategy.](https://academic.oup.com/ecco-jcc/article-abstract/9/12/1160/342968)
3.1. Sexual function in IBD patients registered on a national database or presented in a clinical setting

The characteristics of the studies examining the sexual function of IBD patients are shown in Table 1. Three of them represent a series of reports with the same clinical group of patients. Depression was the most important determinant across all IIEF domains [but not total scores], followed by major comorbidity which predicted low scores in the overall satisfaction domain [odds ratio [OR] 4.7, 95% confidence interval [CI]: 1.3–17.1]. Female cases, however, showed statistically significant lower scores across several domains of the Brief Index of Sexual Functioning in Women [BISF-W] compared with friend controls [frequency of intercourse [OR 3.4, 95% CI: 1.6–7.2], receptivity and initiative [OR 2.5, 95% CI: 1.3–5.0], pleasure and orgasm [OR 3.3, 95% CI: 1.6–6.8], partnership satisfaction [OR 2.6, 95% CI: 1.4–4.9], and total BISF-W scores [OR 3.2, 95% CI: 1.6–6.2]].

Timmer et al. 2008 and Timmer et al. 2007b compared sexual function among patients in their normal living environment and with that of patients typically encountered by the university specialist, representing a wide array of clinical problems. No difference in BISF-W and IIEF total scores or sub-scores was identified among the aforementioned groups of patients. In Timmer et al. 2007b, feelings of attractiveness and masculinity among the clinical groups of males with IBD were compromised in those with active disease [p < 0.05 for both, European Organization for Research and Treatment of Cancer-EORTC module], whereas 36% of men reported having been sexually active a lot or quite a bit over the preceding 4 weeks. This was also an issue in Timmer et al. 2008, where feelings of attractiveness and femininity, as also satisfaction with bodily appearance, were impaired among females with active disease [p < 0.05 for all comparisons, EORTC module]. As expected, in Timmer et al. 2007b, depression was a predictor for low sexual function scores in the IIEF, but somatic-related and IBD-specific related predictors were also identified. In particular, the presence of diabetes was associated with impaired erectile function [OR 7.0; 95% CI: 1.4–35.0], as was the presence of active disease with low scores in the erectile function domain [OR 2.5; 95% CI: 1.3–4.9], in the orgasmic function domain [OR 4.3; 95% CI: 2.0–9.3], and in the sexual desire domain [OR 2.5; 95% CI: 1.1–5.5]. On the other hand, depression was also the most consistent predictor factor for low sexual function among females in Timmer et al. 2008. Other predictors were frequent relapses and anxiety [intercourse frequency domain OR 2.3, 95% CI: 1.4–4.7 and OR 2.0, 95% CI: 1.1–3.6, respectively] and current use of steroids [pleasure and orgasm domain OR 3.5, 95% CI: 1.5–4.4].

Muller et al. attempted to explore the patients’ perspectives regarding the impact of IBD on sexuality. Female gender was an independent predictive factor for an impaired body image [OR 3.246, p < 0.05], decreased libido [OR 3.574, p < 0.05], and infrequent sexual activity [OR 3.895, p < 0.05]. In accordance with the above findings as well as with the finding of Timmer et al. 2007a, Marin et al. reported significant lower FSFI scores for female patients compared with controls, whereas this was not the case for males. Moreover female patients stated more often compared with males that sexual desire had decreased [p < 0.05] and that their sexual satisfaction worsened [p < 0.05] after IBD diagnosis. A significant proportion of patients [35% females and 13% males vs 16% and 3% of the controls, respectively] reported frequent problems with their body image, which was associated with corticosteroid use, surgical scars, and thinness.

Knowles et al. also reported that female patients encounter sexual problems more often than males [p < 0.05], although disease or operative status did not have an influence on the results. Sexual problems, body image, and self-consciousness during intimacy were positively associated with illness perceptions [r = 0.32, p < 0.01 and r = 0.28, p < 0.05, respectively], anxiety [r = 0.26, p < 0.05 and r = 0.34, p < 0.01, respectively], and depression [r = 0.42, p < 0.05 and r = 0.27, p < 0.05, respectively]. Furthermore, sexual satisfaction was negatively correlated with depression [r = -0.43, p < 0.05], anxiety [r = -0.30, p < 0.01], sexual problems [r = -0.48, p < 0.05], and illness perceptions [r = -0.29, p < 0.05]. Sexual problems were shown to mediate the relationship between depression and sexual satisfaction, whereas female gender was the only demographic variable predicting greater sexual problems but also greater sexual satisfaction.

3.2. Sexual function in IBD patients after surgery

The characteristics of the studies examining the sexual function of IBD patients who underwent surgery are shown in Table 2. Ogilvie et al., examining sexual function among female UC patients who had undergone total proctocolectomy with ileal pouch-anal anastomosis [IPAA], found total FSFI scores below the cut-off point [thus indicating worse sexual function] in approximately half of them. Furthermore the researchers found no measure of pouch function to predict of sexual function. The initial hypothesis of Bengtsson et al., that IBD patients with pelvic pouch failure have worse sexual function compared with IBD patients with functioning pouches, was not confirmed by their results. However, an impaired perception of body image between cases and controls was observed [p < 0.05 for females and p < 0.05 for males].

Wang et al. reported an improved sexual function 6 months after proctocolectomy or completion proctectomy for male IBD patients. Several domains of the IIEF improved after surgery, in particular sexual desire [p < 0.05] and satisfaction with intercourse [p = 0.01]. Furthermore, improved scores were also noted for the Sexual Function Questionnaire [SFQ]. All six domains were improved after surgery: desire [p < 0.05], arousal/sensation [p < 0.05], arousal [p = 0.01], orgasm [p = 0.03], pain [p < 0.05], and enjoyment [p < 0.05]. Total IIEF scores were improved both in male patients with IPAA and those with end ileostomy [p = 0.05 and p = 0.02, respectively]. Of note, total IIEF scores before surgery were remarkably lower among patients who underwent end ileostomy compared with those who underwent IPAA [median scores: 11 vs 59.5]. Conversely, sexual function did not improve among female patients after surgery, except for the desire domain of the FSFI [p = 0.03]. No improvement in any domain of the two questionnaires was observed for the females who underwent end ileostomy. However, total FSFI and SFQ scores before and after surgery did not differ by the type of surgery.

Cornish et al. compared sexual function between IBD females undergoing restorative proctocolectomy [RPC] and IBD females without a stoma or RPC. RPC was not associated with impaired sexual function, since no significant difference was found in any FSFI domain or total scores between cases and controls. Moreover, Kiss et al. found no significant differences in sexual function between IBD patients who had undergone surgery for perianal Crohn’s disease and healthy controls. However, a decreased total FSFI score was associated with additional pelvic floor operations and postoperative exposure to infliximab therapy [p < 0.05 for both]. Several predictive factors were also recognised for impaired male sexual function, that is a loose set on drainage in situ and an abscess at the time of operation negatively.
**Table 1. Characteristics of the studies evaluating sexual function among patients with inflammatory bowel disease (IBD) registered on a national database or presented in a clinical setting [n = 6].**

<table>
<thead>
<tr>
<th>Study</th>
<th>Study design</th>
<th>Participants</th>
<th>Questionnaire*</th>
<th>Outcomes</th>
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<tbody>
<tr>
<td>Timmer et al. 2007a</td>
<td>Case-control</td>
<td>Males and females Cases from the DCCV[random sample]</td>
<td>International Index for Erectile Function [IEEF] Brief Index of Sexual Function in Women [BISF-W]</td>
<td>Males • Total IIEF scores were not statistically different between cases/controls • Depression was associated with low scores in: erectile function [OR 2.7, 95% CI: 1.1–6.5], orgasmic function [OR 3.1, 95% CI: 1.3–10.0], sexual desire [OR 3.6, 95% CI: 1.3–10.0], sexual satisfaction [OR 1.8, 95% CI: 0.8–9.8] • Depression was the major determinant of sexual function across all domains EORTC module [clinical group only] • 44% felt severely compromised sexually due to their IBD IIEF • Depression was associated with low scores in: sexual satisfaction [OR 2.3, 95% CI 1.1–4.9] and overall satisfaction [OR 3.7, 95% CI 1.7–8.3] EORTC module [clinical group only] • Low general interest in sexual activities • Only 20% reported a high/moderate level of sexual activity BISF-W • Depression was associated with low scores in: thoughts and desire [OR 2.9, 95% CI 1.5–5.7], intercourse frequency [OR 3.5, 95% CI 1.6–7.9], initiative and receptivity [OR 4.4, 95% CI 2.1–9.1], pleasure and orgasm [OR 4.8, 95% CI 2.2–10.1], partnership satisfaction [OR 2.7, 95% CI 1.4–5.4] and total scores [OR 3.4, 95% CI 1.4–6.9]</td>
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<tr>
<td>Timmer et al. 2007b</td>
<td>Cross-sectional, comparing two patient groups</td>
<td>Only males Clinical group, consecutive patients from university hospital departments [CD] = 61 MA[random sample] [CD] = 109 MA Patient group from the DCCV [random sample] [CD] = 109 MA [UC] = 77 MA Controls matched from patients' friends and AOK Friends = 113 MA AOK[random sample] = 16 MA Controls matched from patients' friends and AOK Friends = 77 MA AOK[random sample] = 16 MA Controls matched from patients' friends and AOK Friends = 129 MA AOK[random sample] = 109 MA Controls matched from patients' friends and AOK Friends = 41 MA AOK[random sample] = 33 MA Controls matched from patients' friends and AOK Friends = 33 MA AOK[random sample] = 33 MA Controls matched from patients' friends and AOK Friends = 127, UC[random sample] = 85, IC[random sample] = 5</td>
<td>European Organization for Research and Treatment of Cancer [EORTC] module, single items on sexual function and satisfaction International Index for Erectile Function [IEEF]</td>
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<tr>
<td>Timmer et al. 2008</td>
<td>Cross-sectional, comparing two patient groups</td>
<td>Only females Clinical group, consecutive patients from university hospital departments [CD] = 90 MA, CD[random sample] = 33 MA Patient group from the DCCV [random sample] [CD] = 129 MA, UC[random sample] = 33 MA Controls matched from patients' friends and AOK Friends = 129 MA AOK[random sample] = 109 MA Controls matched from patients' friends and AOK Friends = 41 MA AOK[random sample] = 33 MA Controls matched from patients' friends and AOK Friends = 33 MA AOK[random sample] = 33 MA Controls matched from patients' friends and AOK Friends = 127, UC[random sample] = 85, IC[random sample] = 5</td>
<td>European Organization for Research and Treatment of Cancer [EORTC] module, single items on sexual function and satisfaction Brief Index of Sexual Functioning in Women [BISF-W]</td>
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<tr>
<td>Muller et al. 2010</td>
<td>Postal survey</td>
<td>Every eligible patient from the Southern Adelaide IBD Service database Males = 74 Me.A[random sample] = 37.2 y Females = 143 Me.A[random sample] = 34.2 y Controls matched from patients' friends and AOK Friends = 41, UC[random sample] = 33, IC[random sample] = 5</td>
<td>Novel questionnaire by the researchers: relationships, body image, libido, sexual function</td>
<td>Males • Total IIEF scores were not statistically different between cases/controls • Depression was associated with low scores in: erectile function [OR 2.7, 95% CI: 1.1–6.5], orgasmic function [OR 3.1, 95% CI: 1.3–10.0], sexual desire [OR 3.6, 95% CI: 1.3–10.0], sexual satisfaction [OR 1.8, 95% CI: 0.8–9.8] • Depression was the major determinant of sexual function across all domains EORTC module [clinical group only] • 44% felt severely compromised sexually due to their IBD IIEF • Depression was associated with low scores in: sexual satisfaction [OR 2.3, 95% CI 1.1–4.9] and overall satisfaction [OR 3.7, 95% CI 1.7–8.3] EORTC module [clinical group only] • Low general interest in sexual activities • Only 20% reported a high/moderate level of sexual activity BISF-W • Depression was associated with low scores in: thoughts and desire [OR 2.9, 95% CI 1.5–5.7], intercourse frequency [OR 3.5, 95% CI 1.6–7.9], initiative and receptivity [OR 4.4, 95% CI 2.1–9.1], pleasure and orgasm [OR 4.8, 95% CI 2.2–10.1], partnership satisfaction [OR 2.7, 95% CI 1.4–5.4] and total scores [OR 3.4, 95% CI 1.4–6.9]</td>
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Moreover, additional pelvic floor operations, smoking, and current pelvic complaints were associated with worse orgasmic function \( p < 0.05 \) for all.\(^\text{17}\) Finally, patients with a presence of an abscess at the time of operation, a loose set on drainage in situ, current pelvic complaints, and complex fistula were negatively correlated with sexual desire \( p < 0.05 \) for all.\(^\text{17}\) The

<table>
<thead>
<tr>
<th>Study</th>
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<th>Participants</th>
<th>Questionnaire*</th>
<th>Outcomes</th>
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<tbody>
<tr>
<td>Marin et al. 2013</td>
<td>Cross-sectional Case-control</td>
<td>Males and females Cases from databases of two hospitals Males Me.A' = 46.5 y, CD(^{\times}) = 63, UC(^{#}) = 90 Females Me.A' = 42.7 y, CD(^{#}) = 89, UC(^{#}) = 113 Controls matched from patients’ friends Males = 73, Me.A' = 46.1 y Females = 127, Me.A' = 41.1 y</td>
<td>International Index for Erectile Function [IIEF] Female Sexual Function Index [FSFI]</td>
<td>• Sexual activity: 57.6% decreased frequency [females vs males ( p &lt; 0.0001 ), operated vs unoperated ( p = 0.0113 )] • Libido 58.5% decreased libido [females vs males ( p = 0.0005 ), operated vs unoperated ( p = 0.035 )] Males • Total IIEF scores were not different between cases/controls • Cases had lower scores in erectile function ( p = 0.044 ) and desire domains ( p = 0.031 )</td>
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Knowles et al. 2013 | Online survey | Males and females Recruited via online adverts Males = 13, Females = 64 CD\(^{\times}\) = 44, UC\(^{\#}\) = 33 Me.A' = 38 y | Sexual Problems Scale [SPS] Sexual Satisfaction Scale [SSS] Body Image and Self-consciousness during Intimacy Scale [BISC] | • Depression [OR 0.069, 95% CI 0.019–0.248,] need for biological agents [OR 0.172, 95% CI 0.049–0.602], and diabetes [0.182, 95% CI 0.040–0.836, \( p = 0.028 \)] were independent risk factors for sexual dysfunction Femaless • Total FSFI scores were lower in cases \( p = 0.0001 \) • Need for corticosteroids [OR 0.423, 95% CI 0.231–0.77] was independently associated with female sexual dysfunction Males • 53.9% reported lack of sexual interest and 17.4% difficulty getting or keeping an erection Femaless • 83.6% reported a lack of sexual interest and 55.7% difficulty having an orgasm Sexual satisfaction was influenced by anxiety through the mediation of body image and self-consciousness during intimacy. |

*Only questionnaires relevant to sexual function are presented.

\( OR \), odds ratio; \( CI \), confidence interval; \( ^{\times}CD \), Crohn’s disease; \( ^{\#}UC \), ulcerative colitis; \( ^{\#}IC \), intermediate colitis; \( ^{\#}MA \), median age; \( ^{\#}Me.A \), mean age; \( ^{\#}y \), years old; \( ^{\times}DCCV \), German Crohn’s and Colitis Association/Deutsche Crohn und Colitis Vereinigung; \( ^{\times}AO \), Allgemeine Ortskrankenkassen; \( ^{\#}AOK \), Bayern, Amberg, Germany.
### Table 2. Characteristics of the studies evaluating sexual function among patients with inflammatory bowel disease (IBD) who underwent surgery ($n = 8$).

<table>
<thead>
<tr>
<th>Study</th>
<th>Study design</th>
<th>Participants</th>
<th>Intervention/Questionnaire</th>
<th>Outcomes</th>
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</table>
| Ogilvie et al. 2008    | Cross-sectional           | Only females Every eligible UC patient from the University of Minnesota and affiliated hospitals database $n = 83$, Me.$\bar{A}' = 38.4$ y$^-$ | All patients had undergone TPC$^+$ with IPAA$^+$ for refractory UC Female Sexual Function Index [FSFI, modified] | • 47% had low total FSFI score  
• Measures of pouch function were not associated with sexual dysfunction  
• 55–80% reported either an improvement or no change in the domains of FSFI after the surgery |
| Bengtsson et al. 2011  | Case-control              | Males and females Pool of patients operated on with IPAA$^+$ in Gothenburg, Sweden [$n = 593,19822005$, follow-up 2008]  
Cases [pouch failure] Males: 13 MA$^+$: 50 y$^-$  
Females: 16 MA$^+$: 53 y$^-$ Controls [non pouch failure] Males: 32 MA$^+$: 49 y$^-$  
Females: 40 MA$^+$: 52 y$^-$ | 583 patients with UC and 10 with CD$^a$ had undergone IPAA$^+$ International Index for Erectile Function [IIEF] Female Sexual Function Index [FSFI] | Males  
• Total IIEF scores were lower but not statistically different between cases/controls  
• Total SFQ scores were lower but not statistically different between cases/controls |
| Wang et al. 2011       | Prospective cohort study  | Males and females Every eligible IBD patient from the University of California San Francisco Center for Colorectal Surgery, completed questionnaires before and after surgery  
Males: 41 Me.$\bar{A}' = 41.2$ y$^-$  
Females: 25 Me.$\bar{A}' = 40.5$ y$^-$ | All patients underwent either a proctectomy or completion proctectomy International Index for Erectile Function [IIEF] Female Sexual Function Index [FSFI] Sexual Function Questionnaire [SFQ] | Males  
• Total IIEF scores significantly improved after surgery [$p = 0.003$]  
• Total SFQ scores significantly improved after surgery [$p = 0.001$] |
| Cornish et al. 2012    | Case-control              | Only females Every eligible IBD patient from 2 outpatient clinics [2 hospitals]  
Cases controls $n = 54$, Me.$\bar{A}' = 41.8$ y$^-$  
$n = 55$, Me.$\bar{A}' = 43.8$ y$^-$ | Cases had undergone RPC$^-$ Female Sexual Function Index [FSFI] | Females  
• Total FSFI domain scores and total scores were not statistically different between cases/controls  
• Total IIEF scores did not improve after surgery [$p = 0.6$]  
• Total SFQ scores did not improve after surgery [$p = 0.6$] |
| Riss et al. 2013       | Case-control              | Males and females Cases with perianal CD$^a$ from the Medical University of Vienna database  
Males: 22, females: 47, MA$^+$: 46.5 y$^-$ Controls were healthy subjects contacted  
Males: 22, females: 47, MA$^+$: 48 y$^-$ | Cases were operated on for anal abscess and fistulas International Index for Erectile Function [IIEF] Female Sexual Function Index [FSFI] | Males  
• Total IIEF scores of cases were comparable to controls, no statistically significant difference between cases/controls  
• Total FSFI scores were lower but not statistically different between cases/controls |
| Yoshida et al. 2014    | Cohort study              | Males and females UC patients from the Mie University Hospital outpatient clinic [random sample]  
Males: 30 Me.$\bar{A}' = 38.6$ y$^-$  
Females: 31 Me.$\bar{A}' = 44.3$ y$^-$ [age at the time of RP-IPAA$^+$] | All patients had undergone RP-IPAA$^+$ for UC Japanese version of the Inflammatory Bowel Disease Questionnaire [IBDQ-J] [1 item for sexual activity] | Males  
• Total IIEF scores did not improve after surgery [$p = 0.6$]  
• Total SFQ scores did not improve after surgery [$p = 0.6$]  
• FSFI domain scores and total scores were not statistically different between cases/controls |
Table 2. Continued

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<thead>
<tr>
<th>Study</th>
<th>Study design</th>
<th>Participants</th>
<th>Intervention/Questionnaire*</th>
<th>Outcomes</th>
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<tr>
<td>Hicks et al. 2014</td>
<td>Cohort study</td>
<td>Males and females All eligible UC patients underwent IPAA&lt;sup&gt;2&lt;/sup&gt;</td>
<td>All patients underwent resection of the rectum via either an IME&lt;sup&gt;2&lt;/sup&gt; or a TME&lt;sup&gt;2&lt;/sup&gt;-technique</td>
<td>• Main reasons for poor sexual activity were: fecal soiling [n = 5], decreased sexual desire [n = 4], no partner [n = 4], no intercourse since before IPAA [n = 4], erectile dysfunction [n = 3]</td>
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<td>IME: Me.A = 35.3 y&lt;sup&gt;1&lt;/sup&gt;, males = 56.4%</td>
<td>Female Sexual Function Index [FSFI]</td>
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<td>TME: Me.A = 35.1 y&lt;sup&gt;1&lt;/sup&gt;, males = 58.8%</td>
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<tr>
<td>El-Gazzaz et al. 2010</td>
<td>Cohort study</td>
<td>Only females CD&lt;sup&gt;3&lt;/sup&gt; patients from a pelvic floor database: n = 65, Me.A = 42.3 y&lt;sup&gt;1&lt;/sup&gt;</td>
<td>All patients had CD&lt;sup&gt;4&lt;/sup&gt;-related RVF&lt;sup&gt;7&lt;/sup&gt; and had surgical procedures with intent to close the fistula</td>
<td>• Total IIEF scores similar between IME&lt;sup&gt;5&lt;/sup&gt; and TME&lt;sup&gt;5&lt;/sup&gt;-technique [p = 0.54].</td>
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<td>Of these n = 16 agreed to complete the sexual function questionnaire</td>
<td>Female Sexual Function Index [FSFI]</td>
<td>• Scores on all IIEF subscales were also similar between groups [p ≥ 0.22]</td>
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*Only questionnaires relevant to sexual function are presented.
UC, ulcerative colitis; CD, Crohn’s disease; Me, median age; Me.A, mean age; y, years old; TPC, total proctocolectomy; IPAA, ileal pouch-anal anastomosis; RPC, restorative proctocolectomy; RP-IPAA, reconstructive proctocolectomy with ileal J-pouch-anal anastomosis; IME, intramesorectal excision; TME, total mesorectal excision; RVF, rectovaginal fistulae; IBDQ-J, Inflammatory Bowel Disease Questionnaire, Japanese version.

longer duration of CD had lower levels of satisfaction with intercourse [p < 0.05], whereas overall satisfaction was impaired in patients with additional pelvic floor operations [p < 0.05].

Yoshida et al. found decreased sexual activity in 19 of a total 61 UC patients who had undergone restorative proctocolectomy with ileal J-pouch-anal anastomosis [RP-IPAA]. Predictive factors for poor sexual activity were the performance of RP-IPAA after the age of 40 [OR 22, 95% CI: 1.8–270, p = 0.02] and a total preoperative corticosteroid dose ≥15 g [OR 7.4, 95% CI: 1.1–4.9, p = 0.04].

On the other hand, Hicks et al. found no difference in sexual function among male and female UC patients who underwent resection of the rectum via either an intramesorectal excision or a total mesorectal excision technique<sup>9</sup> [Table 2]. Furthermore, there seems to be no difference in sexual function among healed and unhealed women treated surgically for rectovaginal fistula<sup>20</sup> [Table 2].

4. Discussion
As defined by the World Health Organization, sexual health is a state of physical, emotional, mental, and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction, or infirmity.<sup>21</sup> Among the principal forces that interact to influence the person’s sexuality stands the progression through childhood, adolescence, adulthood, and later life.<sup>22</sup> This is an important issue in IBD, since IBD usually strikes adolescents or young adults who are also facing developmental milestones important to sexual health.<sup>23</sup> Thus it seems vital to address every aspect of those patients’ everyday lives in order to facilitate normalisation in quality of life and to effectively manage the direct and indirect costs to both the health care system and society.<sup>24</sup> Almost two decades ago it was recognised that sexual health issues in IBD patients include growth and development, body image, intimacy, sexual functioning, fertility, and pregnancy, which all may be influenced by the disease itself or by the medical and surgical interventions used for treatment.<sup>25</sup> However, the results of this review have shown that little progress in the field of sexual function has been achieved in the past 10 years. Only 14 studies have been identified that addressed this issue in cohorts of IBD patients. Apart from the single item regarding sexual activity that the Inflammatory Bowel Disease Questionnaire [IBDQ] includes, no questionnaire evaluating sexual function specifically for IBD patients has been developed. Therefore the existing studies have used generic instruments. Thus it seems crucial that future studies should focus on the
development of a new instrument that could evaluate sexual function among IBD patients in a standardised manner.

The majority of the studies showed an impaired sexual function among IBD patients, with female patients more adversely affected compared with males.\textsuperscript{5,12,13,14} Furthermore, depression was identified as the most consistent negative predictive factor of sexual function across studies, which could be attributed to the chronic course of the disease.\textsuperscript{5,10,11,14} It has been reported that the relationship between chronic conditions and depression or anxiety can be experienced as independent or inter-related [with either one causing the other].\textsuperscript{14} In the majority of the cases, patients tend to experience depression or anxiety as a consequence of being diagnosed with a chronic disease, and a cyclical relationship between the two has been described.\textsuperscript{25}

Concerning sexual function among IBD patients after surgery, findings are rather inconsistent. Although an impaired sexual function has been reported among IBD patients who had undergone surgery,\textsuperscript{19,20} half of the studies identified that had case-control design did not find significant differences between IBD patients who had undergone surgery and controls.\textsuperscript{26,10,25} In the only study with a prospective design, an improvement after surgery was recorded for male patients in several domains of sexual function, whereas this was not the case for the female patients.\textsuperscript{26} Female sexual function remained impaired after surgery, a finding that may be accounted for by unexamined aspects of female sexual function.\textsuperscript{17} Thus, more studies examining sexual function among patients who had undergone surgery are needed.

Furthermore, two of the studies identified reported a negative relationship between current use of corticosteroids and problems with body image or several domains of sexual function.\textsuperscript{5,11} However, by reviewing all papers we realised that no standard or intermittent doses of corticosteroids or other therapies were specifically examined across studies and thus firm conclusions cannot be drawn. Future studies are needed in order to clarify the relationship between chronic pharmacotherapies and sexual function among IBD patients.

Another disturbing finding is the fact that it has been reported that a significant proportion of IBD patients are unwilling to tell their physician something potentially important about their illness.\textsuperscript{5} In fact, only a small proportion seems willing to discuss sexuality with their treating physician, and the majority expressed the opinion that information about the impact of IBD on intimacy and sexuality should be given at IBD diagnosis and that the IBD specialist is appropriate for clarifying doubts.\textsuperscript{5,11} On the other hand, physicians may also overlook identifying sexual dysfunction among their patients. Thus, the need to properly address every aspect of IBD patients’ lives is highlighted.

The long-term disability rate and economic and social impact of IBD are significant and therefore it is crucial to investigate the role of better control of patients in order to achieve improved long-term outcomes and an ultimately normal life.\textsuperscript{24} It seems apparent that sexual function is an important health issue among IBD patients and is often impaired. Proper attention is needed from treating physicians in order to aid their patients in communicating their needs and problems and fill the existing gap in this area. The conduct of further studies is mandatory in order to explore every aspect of sexual function in IBD patients, develop specific instruments to evaluate it, and finally manage any impairment properly.

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