

## The Incidence of Sexual Dysfunction in Patients With Irritable Bowel Syndrome



Jeanette Sørensen, MD,<sup>1,2,3</sup> Birgitte Schantz Laursen, PhD,<sup>4,5</sup> Asbjørn Mohr Drewes, DMSc,<sup>2,6</sup> and Anne Lund Krarup, PhD<sup>1,2,6</sup>

### ABSTRACT

**Introduction:** Several studies have suggested that patients with irritable bowel syndrome (IBS) frequently have symptoms of sexual dysfunction.

**Aim:** The current study aims to map the current knowledge about the burden of sexual dysfunction in patients with IBS.

**Methods:** A literature review was conducted on PubMed and EMBASE using the following search terms or combinations thereof: irritable bowel syndrome; functional colonic disease; sexual function; sexual health; sexual behavior; sexual dysfunction; dyspareunia; erectile dysfunction; quality of life; and questionnaire.

**Main Outcome Measure:** Sexual dysfunction.

**Results:** 1,273 texts were found, 331 duplicates were removed, and 844 texts were excluded because they did not meet the inclusion criteria, leaving 98 full text articles. These were examined and it was found that 41 fulfilled the criteria. 4 questionnaires were found; Irritable Bowel Syndrome Quality of Life (IBS-QOL) questionnaire, the Irritable Bowel Syndrome – Quality of Life (IBSQOL) questionnaire, the Irritable Bowel Syndrome-36 question (IBS-36) questionnaire, and the Arizona Sexual Experience Scale. Subscores for sexual relations in IBS-QOL ranged from 37.7–100 (11.9) for patients with IBS and 82.2–100 (6.6) for controls. The IBSQOL and IBS-36 subscores for sexual relations ranged from 49.7–90.5 (9) to 3.9–5.4 (0.8) with no healthy controls for comparison. After interventions were implemented, there was an improvement in subscores (the IBS-QOL mean changed to 10.5%, IBSQOL mean changed to 3.8%, and the IBS-36 mean changed to 40%). The study using Arizona Sexual Experience Scale showed that 51% of patients with IBS had sexual dysfunction and also scored lower on the IBSQOL questionnaire.

**Conclusion:** The information about sexual dysfunction in patients with IBS is sparse and emerges primarily from quality of life questionnaires. It seems as though patients with IBS have more sexual problems compared to controls, but further investigation regarding the extent and type of sexual dysfunction is needed. **Sørensen J, Schantz Laursen B, Drewes AM, et al. The Incidence of Sexual Dysfunction in Patients With Irritable Bowel Syndrome. Sex Med 2019;7:371–383.**

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**Key Words:** Irritable Bowel Syndrome (IBS); Sexual Dysfunction; Diarrhea; Flatulence; Soiling

### INTRODUCTION

Irritable bowel syndrome (IBS) is a common functional gastrointestinal disorder with a prevalence of 12–15% in Europe

and North America.<sup>1</sup> Patients experience abdominal pain, bloating, and changes in stool habits. It is further divided into subtypes, such as constipation dominant, diarrhea dominant, or

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<sup>1</sup>Centre of Neurogastroenterologic Research, Clinic Medicine, The North Regional Hospital, Denmark;

<sup>2</sup>Department of Clinical Medicine, Aalborg University, Denmark;

<sup>3</sup>Centre for Clinical Research, The North Regional Hospital, Denmark;

<sup>4</sup>Sexological Research Centre, Department of Clinical Medicine, Aalborg University, Denmark;

<sup>5</sup>Clinical Nursing Research Unit, Aalborg University Hospital, Denmark;

<sup>6</sup>MechSense, Department of Gastroenterology and Hepatology, Aalborg University Hospital, Denmark

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mixed type. The recommendation for diagnosing IBS is to make use of the Rome IV criteria.<sup>2</sup>

Quality of life (QOL) in patients with IBS has been shown to be as low as the QOL measured in patients with diabetes mellitus or end-stage renal disease.<sup>3</sup> However, the disease does not only have a negative impact on the general health-related QOL, but also more specifically on sexual dysfunction. Hence, symptoms of bloating, flatulence, soiling, and abdominal pain can impact sexual life, and previous studies have shown significant sexual dysfunction in patients suffering from IBS when compared to healthy controls.<sup>4–6</sup>

In recent years, there has been more focus on sexual dysfunction in patients suffering from inflammatory bowel disease.<sup>7,8</sup> Studies have shown not only a higher occurrence of sexual dysfunction, but also of sexual dysfunction independent of disease severity.<sup>7</sup> With a major overlap in symptoms between IBS and inflammatory bowel disease, it could be speculated that sexual dysfunction is also problematic for patients with IBS.<sup>9,10</sup>

Even though patients with IBS have symptoms that can lead to sexual problems, no systematic reviews have targeted sexual dysfunction in IBS. Knowledge in this field is of clinical relevance to health care professionals in order to improve QOL in this patient group. Therefore, we conducted a systematic review with the primary objective of synthesizing existing knowledge regarding sexual dysfunction among patients suffering from IBS.

In general, sexuality and sexual functioning have been demonstrated to be important for well-being and QOL. In a Danish population study, 90% stated that their sexuality was important, very important, or extremely important for their well-being. Furthermore, sexuality and intimacy can provide means for coping and developing survivorship skills for people living with a life-threatening or chronic disease, as sexual and intimate encounters can serve as a refuge in an otherwise chaotic and turbulent situation.<sup>11</sup>

## METHODS

A systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.<sup>12</sup> Systematic searches in the PubMed and EMBASE databases were undertaken in November 2018. The search strategy used consisted of the following terms: “functional colonic disease,” “irritable bowel syndrome,” and “quality of life,” both in Mesh terms and text words. They were combined using AND in conjunction with the terms “surveys and questionnaires” (both in Mesh terms and text words) and then again combined using AND in conjunction with the terms “sexual dysfunction” (Mesh), “sexual behavior” (Mesh), “sexual health” (Mesh), “sexual” (text word) OR “erectile dysfunction” (text word), and “dyspareunia” (text word). We excluded the following terms: “sex offences” (Mesh), “sexual abuse” (text words), “sexual violence” (text words), and “cancer” (Mesh term and text word).

## Inclusion Criteria

The studies included in the review meet the following inclusion criteria:

1. Peer reviewed articles. The articles showed a broad variety of different types of studies, including observational and prospective studies, but also intervention studies with some randomized trials. A few articles were either validating a new questionnaire or conducted a linguistic validation of an already validated questionnaire.
2. Use of validated questionnaires with 1 or more questions about sexual life. All information regarding sexual dysfunction was accepted (dyspareunia, erectile dysfunction, lack/loss of interest, etc.).
3. Questionnaires with values indicating the level of sexual functioning.
4. Diagnosis of IBS using the Manning, Rome I, II, III, or IV criteria.<sup>13</sup>
5. Publications in English.

## Exclusion Criteria

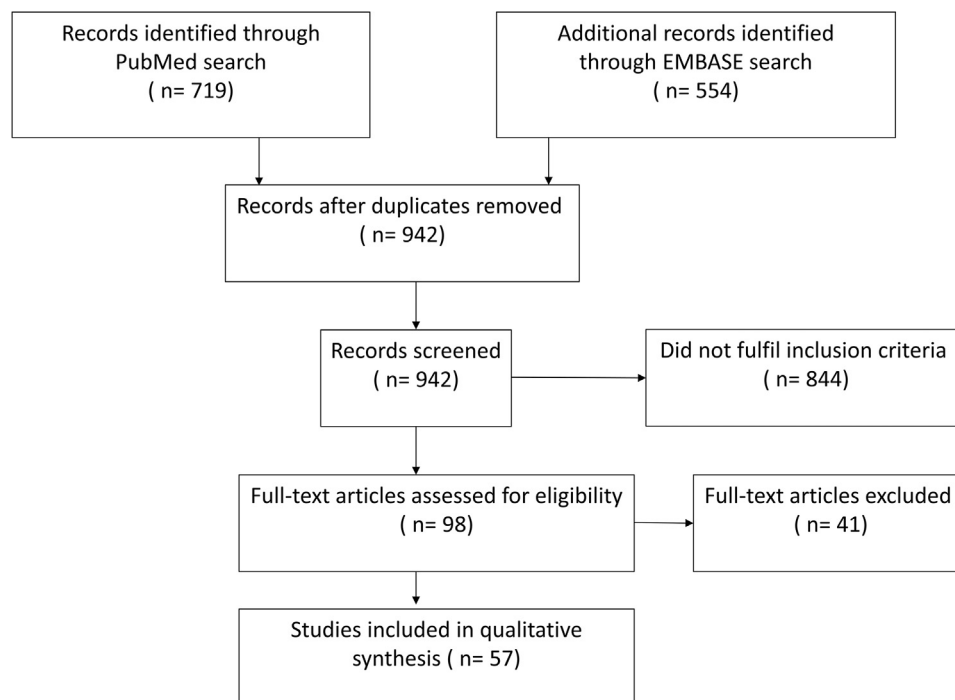
1. Other diseases or illnesses that could explain the sexual dysfunction, including earlier sexual abuse or violence.
2. Age younger than 18 years and older than 90 years.
3. Studies with <10 participants.

## Data Collection and Analysis

The initial screening of the articles was performed by reading the titles and abstracts. If IBS and QOL or any form of sexual relations were mentioned, the articles were assessed more thoroughly looking for specific data on sexual relations. If none was identified, then the articles were excluded. All articles that met the inclusion criteria went through a full text analysis.

## RESULTS

Initially, 1,273 records relevant to the research terms were found in the selected databases (see [Figure 1](#)). Of these, 331 articles were duplicated and, thus, removed, leaving 942 publications. After the first screening, 844 articles were excluded because they did not meet the inclusion criteria. 98 potentially eligible studies were identified. After examining the full texts, 41 articles were excluded. 7 articles did not use the Manning or Rome criteria when diagnosing IBS, and another 2 analyzed functional bowel diseases and not solely IBS. 11 articles did not give precise information on the subscore for sexual relations in the questionnaire. One article was excluded due to the inclusion of children in the cohort. 5 studies only reported changes in the subscore for sexual relations from baseline to after the intervention. 2 studies were excluded as the same cohort was used in other articles that had already been included. The majority (13) of studies was excluded either due to the lack of information



**Figure 1.** Flow diagram for database search.

regarding the questionnaire in use or due to the use of a questionnaire that had not been validated. The final search resulted in the inclusion of 57 studies.

### Questionnaires

In the final search we identified 4 questionnaires with information on sexual relations among patients suffering from IBS. Information primarily came from 2 questionnaires: the Irritable Bowel Syndrome Quality of Life (IBS-QOL)<sup>14</sup> questionnaire and the Irritable Bowel Syndrome – Quality of Life (IBSQOL) questionnaire.<sup>15</sup> A description of these, in addition to the Irritable Bowel Syndrome-36 question (IBS-36)<sup>16</sup> and the Arizona Sexual Experience Scale (ASEX),<sup>17</sup> is provided in Table 1. Only 1 study had sexual dysfunction as a measuring end point. All other studies contained information on sexual relations from a QOL questionnaire.

### IBS-QOL Questionnaire

Of the 57 included studies, 39 studies that make use of the IBS-QOL questionnaire were included. The results of 35 of the studies can be seen in Table 2.<sup>14,18–49</sup> The questionnaire has 2 items regarding sexual function, with the following text: “Because of my bowel problems, sexual activity is difficult for me” and “My bowel problems reduce my sexual desire.” The minimum score is 0, whereas the maximum score is 100, with a higher score indicating higher QOL/less sexual problems. Subscores for sexual relations ranged from 37.7–100 (SD 11.9) for patients with IBS. Only 5 studies reported information for healthy controls with subscores ranging from 82.2–100

(SD 6.6). 14 papers described intervention studies with subscores after intervention of 41.0–100 (SD 12.2). Overall, there was an improvement in subscores after an intervention (mean change of 10.5%).

In total, the subscores for sexual relations vary greatly from one study to another, and only a few studies include healthy controls. In 4 of 5 studies, there were higher scores among healthy controls indicating less sexual problems, whereas the fifth study found no difference in scores between healthy controls and patients with IBS.

Four studies do not include specific data on sexual life but only correlations with other symptoms, and they are, therefore, not included in Table 2 but are described here. Ringel et al<sup>50</sup> looked at QOL and found no difference between patients complaining of bloating and nonbloating, with a sexual life score of 73.4 and 79.8, respectively. Balboa et al<sup>51</sup> show that patients diagnosed with IBS and with upper digestive symptoms had a lower score for sexual relations. The same could not be found for the symptoms of heartburn or clinical functional dyspepsia. Jafari et al<sup>52</sup> looked at the correlation between the IBS-specific symptom burden and sexual relations and found that a lower IBS-QOL sexual relation score correlates with a higher IBS symptom burden. Finally, Le Nevé et al<sup>53</sup> found no significant difference in the scores for sexual relations between patients with IBS with low or high intensity gastrointestinal symptoms.

### IBSQOL Questionnaire

We found 17 studies using the IBSQOL questionnaire, with 15 studies providing specific scores for sexual relations (see

**Table 1.** Questionnaire overview

| Instrument | Author and year      | Description  | Score   |
|------------|----------------------|--|---|
| IBS-QOL    | Patrick et al, 1998  | Disease-specific HRQOL questionnaire including 34 items, measuring 8 dimensions of health, including 2 questions regarding sexual relations  | 5-point Likert response scale ranging from 1 (“not at all”) to 5 (“extremely/a great deal”). A summed total score is transformed into 0–100 range scale (low score indicating low QOL)  |
| IBSQOL     | Hahn et al, 1997     | Disease-specific HRQOL questionnaire including 30 items, measuring 9 dimensions of health, including 3 questions regarding sexual relations  | 5- or 6-graded scale. A summed total score is transformed into a 0–100 range scale (low score indicating low QOL)   |
| IBS-36     | Groll et al, 2002    | Disease-specific HRQOL questionnaire including 36 items, measuring 8 dimensions of health, including 2 questions regarding sexual relations  | 7-point Likert scale where 0 = “never” and 6 = “always,” yielding a score between 0 and 216 (high score indicating low QOL)   |
| ASEX       | McGahuey et al, 2000 | Specific questionnaire for quantification of sexual dysfunction in psychiatric patients measuring 5 core elements (drive, arousal, vaginal lubrication, ability to reach orgasm, and satisfaction from orgasm) | 6-point Likert scale, ranging from 5–30, with a higher score indicating a greater level of sexual dysfunction. A total ASEX score of >19, any 1 item with a score of >5, or any 3 items with a score of >4 would indicate sexual dysfunction. |

ASEX = Arizona Sexual Experience Scale; HRQOL = health related quality of life; IBS-36 = Irritable Bowel Syndrome-36 question; IBS-QOL = Irritable Bowel Syndrome Quality of Life questionnaire; IBSQOL = Irritable Bowel Syndrome – Quality of Life questionnaire.

**Table 3).**<sup>15,54–66</sup> The questionnaire contains 3 items regarding sexual function, asking about interference related to sexual activity, avoidance of sexual activity, and lowered satisfaction levels. The minimum score is 0 and the maximum is 100, with a higher score indicating higher QOL/less sexual problems. Subscores for sexual relations ranged from 49.7–90.5 (SD 9.5). Only 1 study included controls exhibiting other gastrointestinal diseases,<sup>15</sup> and indicates higher subscores for sexual relations than patients with IBS corresponding to better QOL in the sexual domain. None of the studies included healthy controls and it is, therefore, not possible to conclude whether or not patients with IBS have more or less sexual problems than healthy controls.

7 studies had interventions with subscores ranging from 55.2–82 (SD 8.6). 11 of the 14 articles show improvement in subscores after an intervention, corresponding to an increase in QOL in the sexual domain. 2 studies report no change after an intervention and 1 study shows a lower score after intervention.

2 studies do not include specific data on sexual relations, but look at correlations to other factors. Böhn et al<sup>67</sup> looks at the correlation between avoiding specific food items and QOL, and found no significant correlation between sexual relations and food items reported to result in gastrointestinal symptoms. One study only includes data on sexual relations in correlation with low or high frequency symptoms. In general, it was found that a low intensity frequency pattern gave a higher sexual relation score than a high intensity frequency pattern.<sup>68</sup>

### IBS-36 and ASEX

Only 1 study uses the QOL questionnaire IBS-36 (see **Table 4**).<sup>69</sup> The IBS-36 questionnaire contains 2 items

that read: “Did your bowel condition interfere with having sexual relations?” and “Did your bowel symptoms interfere with your desire to have sexual relations with your partner?” The minimum score is 0 and the maximum score is 12, with higher scores indicating more sexual problems. The study does not make use of healthy controls for comparison. There was an improvement in sexual relations subscores and thereby an increase in QOL in the sexual domain after the intervention for all 3 groups in the study (with a mean change of 40%).

Eugenio et al<sup>62</sup> conducted the only study addressing sexual dysfunction more specifically through the use of ASEX. The aim was to compare demographics and clinical factors in women with IBS with or without sexual dysfunction using both ASEX and IBSQOL. The results are reproduced in **Table 5**. The cohort was divided into 2 groups depending on whether or not sexual dysfunction was reported according to the ASEX questionnaire. 51% of the cohort with IBS had sexual dysfunction. They also show that patients with sexual dysfunction have significantly lower sexual relations scores in the IBSQOL, indicating that IBS negatively impacts sexual relations. In order to evaluate the quality of the studies we used Jadad Score. The Jadad Scores for the included studies are shown in **Tables 6–9**.

## DISCUSSION

In this systematic review, a search was done through PubMed and EMBASE for information regarding sexual dysfunction in patients with IBS. We chose these 2 databases as they include research papers from all medical and psychological disciplines. Of the 57 papers included, 56 measured health-related QOL and

Table 2. IBS-QOL questionnaire

| Study              | No of patients | Female | % Female | Age (mean)    | Healthy controls | % with IBS-C | % with IBS-D/Mixed type | Score before intervention | Score before intervention (healthy controls) | Duration of intervention | Intervention type                | Score after intervention (patients) |
|--------------------|----------------|--------|----------|---------------|------------------|--------------|-------------------------|---------------------------|--|--------------------------|----------------------------------|-------------------------------------|
| Abbasnezhad, 2016  | 44             | 28     | 63.6     | 37.5          |                  | 34.1         | 65.9                    | 69.4                      |  | 6 mo                     | Vitamin D                        | 85.1                                |
|                    | 41             | 29     | 70.7     | 38.3          |                  | 34.1         | 65.9                    | 68.4                      |  | 6 mo                     | Placebo                          | 79.5                                |
| Abel, 2018         | 809            | 527    | 65.1     | 46.4          |                  |              |                         | 64.0                      |  | 26 wk                    | Placebo                          | 78.0                                |
|                    | 808            | 537    | 66.5     | 44.8          |                  |              |                         | 64.0                      |  | 26 wk                    | Elux 75                          | 78.0                                |
|                    | 806            | 538    | 66.7     | 45.0          |                  |              |                         | 64.0                      |  | 26 wk                    | Elux100                          | 78.0                                |
| Ahmed, 2011        | 40             | 32     | 80.0     |               | 77.0             | 37.5         | 62.5                    | 67.5                      | 93.7   |                          |                                  |                                     |
| Begtrup, 2013      | 67             | 51     | 76.1     | 31.6          |                  | 20.9         | 79.1                    | 78.2                      |  | 6 mo                     | Probiotics                       | 82.4                                |
|                    | 64             | 46     | 71.9     | 29.4          |                  | 17.2         | 82.8                    | 72.5                      |  | 6 mo                     | Placebo                          | 79.6                                |
| Boltin, 2015       | 15             | 11     | 73.3     | 38.9          |                  | 20.0         | 80.0                    | 73.2                      |  |                          | GAI                              | 73.2                                |
|                    | 19             | 15     | 78.9     | 53.1          |                  | 36.8         | 63.2                    | 75.0                      |  | 8 wk                     | Control                          | 82.9                                |
| Canon, 2017        | 240            |        |          | 22.6          |                  |              |                         | 84.5                      |  |                          |                                  |                                     |
|                    |                | 0      |          |               |                  |              |                         | 90.4                      |  |                          |                                  |                                     |
| Cash, 2017         | 2579           | 1759   | 68.2     | 46.4          |                  |              |                         | 65.2                      |  |                          | Rifaximin open label             |                                     |
|                    | 328            | 222    | 67.7     | 47.9          |                  |              |                         | 69.7                      |  |                          | Rifaximin dbl blind              |                                     |
|                    | 308            | 219    | 71.1     | 45.6          |                  |              |                         | 69.4                      |  |                          | Placebo                          |                                     |
| Cha, 2012          | 25             | 13     | 52.0     | 37.9          |                  |              |                         | 88.0                      |  | 8 wk                     | Probiotics                       | 93.5                                |
|                    | 25             | 11     | 44.0     | 40.3          |                  |              |                         | 92.4                      |  | 8 wk                     | Placebo                          | 97.0                                |
| Cho, 2011          | 124            | 61     | 49.2     | 45.8          | 91.0             | 24.2         | 75.8                    | 89.3                      |  |                          |                                  |                                     |
| Choi, 2011         | 45             | 17     | 37.8     | 40.2          |                  | 22.2         | 77.8                    | 86.6                      |  | 4 wk                     | S.boulardii                      | 92.9                                |
|                    | 45             | 20     | 44.4     | 40.6          |                  | 13.3         | 86.7                    | 85.0                      |  | 4 wk                     | Placebo                          | 86.9                                |
| De Gucht, 2015     | 123            | 108    | 87.8     | 32.4          |                  |              |                         | 70.3                      |  |                          |                                  |                                     |
| Drisko, 2006       | 20             | 15     | 75.0     |               |                  |              |                         | 73.1                      |  | 3-4 wk                   | Diet                             | 79.6                                |
| Drossman, 2009     | 1966           | 1632   | 83.0     | 40.4          |                  |              |                         | 60.2                      |  |                          |                                  |                                     |
| El-Salhy, 2010     | 143            | 136    | 95.1     | 32            |                  | 32.9         | 67.1                    | 76.0                      |  | 3 mo                     | Info, diet, exercise, probiotika | 87.0                                |
| Frändemark, 2018   | 370            | 307    | 83.0     | 35.0 (median) |                  | 9.7          | 90.3                    | 57.8                      |  |                          |                                  |                                     |
| Gholamrezaei, 2011 | 141            | 115    | 81.6     | 30.8          |                  | 32.6         | 67.4                    | 62.1                      |  |                          |                                  |                                     |
| Graham, 2010       | 113            | 113    | 100.0    | 48.5          | 224.0            |              |                         | 64.8                      | 82.8   |                          |                                  |                                     |
| Huang, 2007        | 61             | 36     | 59.0     | 33.4          | 70.0             |              |                         | 37.7                      | 99.3   | 4 wk                     |                                  | 41.0                                |
| Jang, 2014         | 39             | 39     | 100.0    | 21.9          |                  | 53.8         | 46.2                    | 98.1                      |  | 24 wk                    | Cognitive therapy                | 100.0                               |
|                    | 37             | 37     | 100.0    | 21.2          |                  | 45.9         | 54.1                    | 99.3                      |  | 24 wk                    | Control                          | 98.7                                |
| Kang, 2011         | 89             | 16     | 18.0     | 28.1          |                  | 12.4         | 87.6                    | 92.4                      |  | 9 wk                     | Lifestyle modification           | 95.9                                |
| Kim, 2010          | 81             | 81     | 100.0    | 46.2          |                  |              |                         | 86.9                      |  | 4 wk                     | Tegaserod                        | 87.5                                |
| Kopczynska, 2018   | 87             | 69     | 79.3     | 39.2          | 56.0             | 41.2         | 58.8                    | 76.4                      | 99.8   |                          |                                  |                                     |

(continued)

Table 2. Continued

| Study              | No of patients | Female | % Female | Age (mean) | Healthy controls | % with IBS-C | % with IBS-D/Mixed type | Score before intervention | Score before intervention (healthy controls) | Duration of intervention | Intervention type | Score after intervention (patients) |
|--------------------|----------------|--------|----------|------------|------------------|--------------|-------------------------|---------------------------|--|--------------------------|-------------------|-------------------------------------|
| Lauche, 2015       | 44             | 40     | 90.9     | 53.9       |                  | 27.1         | 72.9                    | 76.1                      |  | 3 wk                     | CarO              | 77.1                                |
|                    | 41             |        |          |            |                  |              |                         | 76.5                      |  | 3 wk                     | OlivH             | 76.3                                |
|                    | 41             |        |          |            |                  |              |                         | 80.2                      |  | 3 wk                     | OlivC             | 85.8                                |
| Lee, 2008          | 159            | 144    | 63.6     | 39.4       |                  |              |                         | 69.0                      |  |                          |                   |                                     |
|                    | 261            | 228    | 63.6     | 40.7       |                  |              |                         | 73.4                      |  |                          |                   |                                     |
| Park, 2006         | 103            | 74     | 71.8     | 38.3       |                  | 46.0         | 54.0                    | 87.1                      |  |                          |                   |                                     |
| Park, 2009         | 664            | 367    | 55.3     | 43.0       |                  | 25.3         | 74.7                    | 86.7                      |  |                          |                   |                                     |
| Patrick, 1998      | 155            | 138    | 89.0     | 39.0       |                  |              |                         | 73.5                      |  |                          |                   |                                     |
| Remes-Troche, 2015 | 47             | 44     | 93.6     | 42.0       | 49.0             | 53.0         | 47.0                    | 85.0                      |  |                          |                   | 97.0                                |
| Schmulson, 2007    | 63             | 63     | 100.0    | 42.6       |                  | 51.0         | 49.0                    | 76.6                      |  |                          |                   |                                     |
|                    | 63             | 63     | 100.0    | 42.5       |                  | 51.0         | 49.0                    | 71.8                      |  |                          |                   |                                     |
| Sherwin, 2016      | 101            | 79     | 78.2     | 42.0       |                  |              |                         | 66.8                      |  |                          |                   |                                     |
| Singh, 2015        | 54             | 47     |          | 45.4       |                  | 100          |                         | 73.9                      |  |                          |                   |                                     |
|                    | 56             | 51     |          | 42.8       |                  |              | 100                     | 74.6                      |  |                          |                   |                                     |
|                    | 121            | 85     |          | 41.3       |                  |              | 100                     | 68.8                      |  |                          |                   |                                     |
| Tana, 2009         | 26             | 13     | 50.0     | 21.9       | 26.0             | 42.3         | 57.7                    | 100.0                     | 100.0  |                          |                   |                                     |
| ten Berg, 2006     | 169            | 105    | 62.1     | 50.2       |                  |              |                         | 83.0                      |  |                          |                   |                                     |
| Voci, 2009         | 144            | 144    | 100.0    | 32.5       |                  | 7.0          | 93.0                    | 52.4                      |  |                          |                   |                                     |
| Zhu, 2015          | 227            |        |          | 44.68      |                  |              |                         | 83.1                      |  |                          |                   |                                     |
|                    |                | 94     |          |            |                  |              |                         | 82.3                      |  |                          |                   |                                     |
|                    | 133            | 0      |          |            |                  |              |                         | 83.7                      |  |                          |                   |                                     |

Some studies have several groups included in the study; each are listed in the table above.

CarO = caraway oil poultice; GAI = guided affective imagery; IBS-QOL = Irritable Bowel Syndrome Quality of Life questionnaire; OlivC = non-heated olive oil poultice; OlivH = hot olive oil poultice; S. boulardii = *Saccharomyces boulardii*.

**Table 3.** IBSQOL Questionnaire

| Study             | No of patients | Female | % Female | Age (mean) | Healthy controls | % with IBS-C | % with IBS-D/Mixed type | Score before intervention (patients) | Score before intervention (controls) | Duration of intervention | Intervention type            | Score after intervention |
|-------------------|----------------|--------|----------|------------|------------------|--------------|-------------------------|--------------------------------------|--------------------------------------|--------------------------|------------------------------|--------------------------|
| Amouretti, 2006   | 253            | 192    | 75.9     | 47.6       |                  |              |                         | 79.5                                 |                                      |                          |                              |                          |
|                   | 61             |        | 0.0      | 48.5       |                  |              |                         | 90.5                                 |                                      |                          |                              |                          |
| Bjorkman, 2015    | 405            | 405    | 72.7     | 43.1       |                  |              |                         | 58.0                                 |                                      |                          |                              |                          |
|                   | 152            | 0      | 0.0      | 40.1       |                  |              |                         | 69.0                                 |                                      |                          |                              |                          |
| Chassany, 1998    | 227            |        |          |            |                  |              |                         | 65.0                                 |                                      |                          |                              |                          |
| Cremonini, 2012   | 705            | 177    | 100.0    | 45.9       |                  |              |                         | 51.8                                 |                                      | 2 wk                     | Alosetron 0.5 mg             |                          |
|                   |                | 175    | 100.0    | 46.6       |                  |              |                         | 52.7                                 |                                      | 2 wk                     | Alosetron 1.0 mg once a day  |                          |
|                   |                | 177    | 100.0    | 47.7       |                  |              |                         | 55.9                                 |                                      | 2 wk                     | Alosetron 1.0 mg twice a day |                          |
|                   |                | 176    | 100.0    | 46.6       |                  |              |                         | 53.9                                 |                                      | 2 wk                     | Placebo                      |                          |
| Euenio, 2012      | 86             | 86     | 100.0    | 38.7       |                  |              |                         | 69.7                                 |                                      |                          | Non-sexual dysfunction       |                          |
|                   |                | 89     | 89       | 100.0      | 46.2             |              |                         | 69.7                                 |                                      |                          | Sexual dysfunction           |                          |
| Hahn, 1997        | 248            |        |          |            | 37.0             |              |                         | 64.9                                 | 90.0                                 |                          |                              |                          |
| Johannesson, 2015 | 39             | 32     | 82.1     | 45.0       |                  | 28.2         | 71.8                    | 60.0                                 |                                      | 12 wk                    | Physical activity            | 60                       |
| Lindfors, 2012    | 45             | 35     | 77.8     | 40         |                  | 15.6         | 84.4                    | 49.7                                 |                                      | 1 y                      | Hypnotherapy                 | 61.3                     |
|                   | 45             | 36     | 80.0     | 41         |                  | 15.6         | 84.4                    | 54.7                                 |                                      | 3 mo                     | Control                      | 55.2                     |
| Lindfors, 2013    | 83             | 65     | 78.3     | 42.0       |                  | 15.7         | 84.3                    | 55.1                                 |                                      | 12 wk                    | Hypnotherapy                 | 60.9                     |
| Ringstrøm, 2007   | 218            | 151    | 69.3     | 42.0       |                  | 20.2         | 79.8                    | 74.0                                 |                                      |                          |                              |                          |
| Ringstrøm, 2009   | 72             | 117    | 162.5    | 38         |                  | 21.7         | 78.3                    | 58.0                                 |                                      | 6 mo                     | IBS-school                   | 75                       |
|                   | 71             | 117    | 164.8    | 38         |                  | 21.7         | 78.3                    | 58.0                                 |                                      | 6 mo                     | Guidebook                    | 67                       |
| Ringstrøm, 2012   | 40             | 33     | 82.5     | 36.0       | 0.0              | 27.5         | 72.5                    | 50.0                                 |                                      | 12 mo                    | Long group IBS-School        | 67                       |
|                   | 40             | 37     | 92.5     | 38.0       | 0.0              | 17.5         | 82.5                    | 58.0                                 |                                      | 12 mo                    | Short group IBS school       | 54                       |
| Simrén, 2009      | 37             | 37     | 100.0    | 42         |                  | 13.0         | 87.0                    | 67.0                                 |                                      |                          | Active                       | 75                       |
|                   | 37             | 37     | 100.0    | 44         |                  | 16.0         | 84.0                    | 67.0                                 |                                      |                          | Control                      | 67                       |
| Watson, 2001      | 317            |        |          | 45.3       |                  |              |                         | 64.0                                 |                                      | 12 wk                    | Placebo                      | 69                       |
|                   | 309            |        |          | 46.5       |                  |              |                         | 70.0                                 |                                      | 12 wk                    | Alo001                       | 82                       |
|                   | 323            |        |          | 45.6       |                  |              |                         | 63.0                                 |                                      | 12 wk                    | Placebo                      | 68                       |
|                   | 324            |        |          | 46.5       |                  |              |                         | 69.0                                 |                                      | 12 wk                    | Alo002                       | 80                       |
| Williams, 2006    | 98             | 0      | 0.0      |            |                  |              |                         | 75.7                                 |                                      |                          | Healthcare seekers           |                          |
|                   | 239            | 239    | 100.0    |            |                  |              |                         | 72.2                                 |                                      |                          | Healthcare seekers           |                          |

Alo001 = alosetron hydrochloride (U.S. clinical trial study S3BA001); Alo002 = alosetron hydrochloride (U.S. clinical trial study S3BA3002); IBS = irritable bowel syndrome; IBSQOL = Irritable Bowel Syndrome – Quality of Life questionnaire.

**Table 4.** IBS-36 questionnaire

| Study        | No of patients | Female | % Female | Age (mean) | Healthy controls | % with IBS-C | % with IBS-D/Mixed type | Score before intervention | Score before intervention (healthy controls) | Duration of intervention | Intervention type | Score after intervention (patients) |
|--------------|----------------|--------|----------|------------|------------------|--------------|-------------------------|---------------------------|--|--------------------------|-------------------|-------------------------------------|
| Wilson, 2013 | 15             | 10     | 66.7     | 49.1       |                  |              |                         | 5.4                       |  | 6 wk                     | SBI 10 g          | 3.2                                 |
|              | 16             | 8      | 50.0     | 44.9       |                  |              |                         | 4.3                       |  | 6 wk                     | SBI 5 g           | 2.9                                 |
|              | 14             | 10     | 71.4     | 47.8       |                  |              |                         | 3.9                       |  | 6 wk                     | Placebo           | 2.0                                 |

IBS-36 = Irritable Bowel Syndrome-36 question; SBI = serum-derived bovine immunoglobulin/protein isolate.

**Table 5.** ASEX questionnaire

| Study         | No of patients | Female | % Female | Age (mean) | Healthy controls | % with IBS-C | % with IBS-D/Mixed type | Score before intervention | IBSQOL - subscore sexual relations | ASEX sexual dysfunction |
|---------------|----------------|--------|----------|------------|------------------|--------------|-------------------------|---------------------------|------------------------------------|-------------------------|
| Eugenio, 2012 | 86             | 86     | 100      | 38.7       |                  | 23           | 77                      | 11.9                      | 69.7                               | No dysfunction          |
|               | 89             | 89     | 100      | 46.2       |                  | 28           | 72                      | 20.6                      | 69.7                               | Dysfunction             |

ASEX = Arizona Sexual Experience Scale.



**Table 6.** Jadad score for studies using IBS-QOL.

| Jadad score        | Randomization | Double blind | Withdrawals/dropout | Total points |
|--------------------|---------------|--------------|---------------------|--------------|
| Abbasnezhad, 2016  | 2             | 2            | 1                   | 5            |
| Abel, 2018         | 1             | 2            | 0                   | 3            |
| Ahmed, 2011        | 0             | 0            | 0                   | 0            |
| Begtrup, 2013      | 2             | 2            | 1                   | 5            |
| Boltin, 2015       | 2             | 0            | 0                   | 2            |
| Canon, 2017        | 0             | 0            | 1                   | 1            |
| Cash, 2017         | 2             | 2            | 0                   | 4            |
| Cha, 2012          | 2             | 2            | 1                   | 5            |
| Cho, 2011          | 0             | 0            | 1                   | 1            |
| Choi, 2011         | 2             | 2            | 1                   | 5            |
| De Gucht, 2015     | 0             | 0            | 0                   | 0            |
| Drisko, 2006       | 0             | 0            | 1                   | 1            |
| Drossman, 2009     | 0             | 0            | 0                   | 0            |
| El-Salhy, 2010     | 0             | 0            | 1                   | 1            |
| Frändemark, 2018   | 0             | 0            | 1                   | 1            |
| Gholamrezaei, 2011 | 0             | 0            | 0                   | 0            |
| Graham, 2010       | 0             | 0            | 1                   | 1            |
| Huang, 2007        | 0             | 0            | 1                   | 1            |
| Jang, 2014         | 2             | 0            | 1                   | 3            |
| Kang, 2011         | 0             | 0            | 1                   | 1            |
| Kim, 2010          | 0             | 0            | 0                   | 0            |
| Kopczynska, 2018   | 0             | 0            | 0                   | 0            |
| Lauche, 2015       | 2             | 0            | 1                   | 3            |
| Lee, 2008          | 0             | 0            | 0                   | 0            |
| Park, 2006         | 0             | 0            | 0                   | 0            |
| Park, 2009         | 0             | 0            | 1                   | 1            |
| Patrick, 1998      | 0             | 0            | 0                   | 0            |
| Remes-Troche, 2015 | 0             | 0            | 0                   | 0            |
| Schmulson, 2007    | 0             | 0            | 0                   | 0            |
| Sherwin, 2016      | 0             | 0            | 0                   | 0            |
| Singh, 2015        | 0             | 0            | 0                   | 0            |
| Tana, 2009         | 0             | 0            | 0                   | 0            |
| ten Berg, 2006     | 0             | 0            | 0                   | 0            |
| Voci, 2009         | 0             | 0            | 0                   | 0            |
| Zhu, 2015          | 0             | 0            | 0                   | 0            |

Ref: Jadad et al, 1996.

Randomization: 1. Was the study described as randomized? Double blinding: Was the study described as double blind? Withdrawals/dropouts? Was there a description of withdrawals and dropouts? Yes = 1 point, No = 0 points. Additional points for randomization described and appropriate, and double blinding described and appropriate. Deduction of points if randomization described but inappropriate or double blinding described but inappropriate. IBS-QOL = Irritable Bowel Syndrome Quality of Life questionnaire.

not sexual relations specifically. Furthermore, most studies contained a QOL assessment only as a secondary end point. In all 56 studies, sexual dysfunction was measured by only 1 item in a QOL questionnaire.

We engaged the literature with 2 questions in mind: which questionnaires are used to describe sexual functioning in patients with IBS, and what information do these questionnaires provide about sexual dysfunction and if it is more or less prevalent in patients suffering from IBS compared to others.

The use of QOL questionnaires gives a broad idea of the general well-being of patients with IBS, however, this does not address what the problem is, nor whether the patient's psychological state has any

influence on the bowel symptoms. It has traditionally been assumed that a low score for sexual relations in a questionnaire equates sexual dysfunction from a clinical perspective. There is no further description of the type and extent of sexual dysfunction and no consideration of which disease or illness the patient may have. In our systematic review, we found that for the IBS-QOL questionnaire only 5 studies had comparable information on healthy controls. The IBS-QOL questionnaire only had information including controls from 1 questionnaire, and these controls were not healthy but were patients with other gastrointestinal disorders. The 1 study making use of the IBS-36 also did not include healthy controls. The review demonstrates that information relating to sexual dysfunction

**Table 7.** Jadad score for studies using IBSQOL

| Jadad score       | Randomization | Double blind | Withdrawals/dropout | Total points |
|-------------------|---------------|--------------|---------------------|--------------|
| Amouretti, 2006   | 0             | 0            | 0                   | 0            |
| Bjorkman, 2015    | 0             | 0            | 0                   | 0            |
| Chassany, 1998    | 0             | 0            | 0                   | 0            |
| Cremonini, 2012   | 2             | 2            | 1                   | 5            |
| Eugenio, 2012     | 2             | 0            | 1                   | 3            |
| Hahn, 1997        | 0             | 0            | 0                   | 0            |
| Johannesson, 2015 | 2             | 0            | 1                   | 3            |
| Lindfors, 2012    | 2             | 0            | 1                   | 3            |
| Lindfors, 2013    | 2             | 0            | 1                   | 3            |
| Ringstrøm, 2007   | 0             | 0            | 0                   | 0            |
| Ringstrøm, 2009   | 2             | 0            | 1                   | 3            |
| Ringstrøm, 2012   | 2             | 0            | 1                   | 3            |
| Simrén, 2009      | 2             | 2            | 1                   | 5            |
| Watson, 2001      | 0             | 2            | 0                   | 2            |
| Williams, 2006    | 0             | 0            | 0                   | 0            |

IBSQOL = Irritable Bowel Syndrome – Quality of Life questionnaire.

in patients with IBS is very sparse and, in most of the published studies, limited to 1 question. Information on the type of sexual dysfunction and the relation to gastrointestinal symptoms is lacking. Nonetheless, it does seem that there could be a lower score indicating more sexual problems for patients with IBS than for healthy controls, when looking solely at the IBS-QOL studies. More studies, however, are required to confirm this.

It is well known that patients with IBS have low QOL, and it is often referred to as also having sexual dysfunction. The evidence supporting the latter comes primarily from older studies.<sup>4,6,70</sup> However, these studies were excluded due to a lack of validated questionnaires or because patients did not fulfil the established Manning or Rome criteria. Whether or not low QOL in patients with IBS results in sexual dysfunction remains to be examined in studies using validated questionnaires.

The present study found the use of only 4 questionnaires, although other questionnaires are also used also to measure QOL and include questions on sexual relations. They are the Patient Health Questionnaire 15, the World Health Organization Quality of Life BREF, and the Modified Manchester Health Questionnaire. Studies using these other questionnaires were excluded due to the lack of specific data on questions regarding sexual relations. For these other QOL questionnaires we expect the same challenges to emerge, as they are constructed for a broad view on health-related QOL and do not specifically focus on sexual relations.

**Table 8.** Study using IBS-36 questionnaire

| Jadad score  | Randomization | Double blind | Withdrawals/dropout | Total points |
|--------------|---------------|--------------|---------------------|--------------|
| Wilson, 2013 | 2             | 2            | 1                   | 5            |

IBS-36 = Irritable Bowel Syndrome-36 question.

The question, however, is whether or not the use of QOL questionnaires can provide exact knowledge about sexual dysfunction by asking 1 question about sexual relations. Bearing in mind that QOL questionnaires are designed to give an overview of many aspects of life and are not specifically designed to give information on sexual life, one can question if the results answers our question “is sexual dysfunction more common in patients suffering from IBS than healthy controls?” The only study that used both IBSQOL and the specific sexual relations questionnaire, ASEX,<sup>62</sup> detected a difference in scores for patients with IBS with and without sexual dysfunction, as defined by the ASEX questionnaire. In other words, the patients with sexual dysfunction scored lower in their sexual relations subscore than those who do not have sexual dysfunction. This might support the assumption that a low score in the IBSQOL questionnaire indicates sexual dysfunction.

A history of sexual abuse among patients suffering from IBS is more common than in healthy controls or patients suffering from other functional gastrointestinal syndromes.<sup>71</sup> We, therefore, excluded studies on this group as it could be a confounder. Furthermore, none of the included studies contained information regarding the patients’ sexual orientations. However, sexuality is a human phenomenon and is independent of gender or sexual orientation.<sup>11</sup> The questionnaires also provide only limited information regarding different sexual domains (desire,

**Table 9.** study using ASEX questionnaire

| Jadad score   | Randomization | Double blind | Withdrawals/dropout | Total points |
|---------------|---------------|--------------|---------------------|--------------|
| Eugenio, 2012 | 2             | 0            | 1                   | 3            |

ASEX = Arizona Sexual Experience Scale.

arousal, lubrication, orgasmic function, satisfaction, and pain) and only covers 1, 2, or 3 items.

### Limitations to the Study

All but 1 of the studies was not intended to solely evaluate sexual dysfunction in patients suffering from IBS. The studies have a great variety in design; some being intervention studies other descriptive, etc. Even though designs for some of the studies may seem similar there are still differences in intervention type, duration of intervention, and control groups. With the use of the Jadad score, we evaluated the quality of the studies (Tables 6, 7, 8, and 9) and found that a majority of the studies using the IBS-QOL questionnaire had a score of 0 or 1 (score 0–5, 0 being the lowest score). For the IBSQOL questionnaire the score overall were higher but still only 2 studies scored 5.

### CONCLUSIONS

Information relating to sexual dysfunction in patients with IBS is sparse in the existing literature and emerges primarily from QOL questionnaires where questions regarding sexual dysfunctions are only 1 of many subscores. Such QOL questionnaires, which dedicate just 1 question to the description of sexual function, are not sufficient to describe the complexity of human sexuality. Nonetheless, from the available research it seems that patients with IBS may have more sexual problems compared to healthy controls. The type and extent of the sexual dysfunction remains unknown and further studies focusing specifically on the patients' sexuality are needed in order to provide further insight and sufficient treatment for patients with IBS.

**Corresponding Author:** Anne Lund Krarup, PhD, Centre of Neurogastroenterologic Research, Clinic Medicine, The North Regional Hospital, Denmark, Bispensgade 37, Hjørring, DK-9800, Denmark. Tel: +45 97 64 08 72; E-mail: [apslk@rn.dk](mailto:apslk@rn.dk)

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### STATEMENT OF AUTHORSHIP

#### Category 1

##### (a) Conception and Design

Jeanette Sørensen; Anne Lund Krarup

##### (b) Acquisition of Data

Jeanette Sørensen; Anne Lund Krarup

##### (c) Analysis and Interpretation of Data

Jeanette Sørensen; Anne Lund Krarup

#### Category 2

##### (a) Drafting the Article

Jeanette Sørensen

##### (b) Revising it for Intellectual Content

Asbjørn Mohr Drewes; Birgitte Schantz Laursen; Anne Lund Krarup

#### Category 3

##### (a) Final Approval of the Completed Article

Asbjørn Mohr Drewes; Birgitte Schantz Laursen; Anne Lund Krarup

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