Sexual disability in patients with chronic non-specific low back pain—a multicenter retrospective analysis

Silvano Ferrari, PT1, Carla Vanti, PT, OMPT, MSc1, Luca Frigau, PhD2, Andrew Anthony Guccione, MSPT, MSc, PhD3, Francesco Mola, PhD2, Martina Ruggeri, PT, OMPT1, Paolo Pillastrini, PT, MSc1*, Marco Monticone, MD4

1) Department of Biomedical and Neuromotor Sciences (DIBINEM), Alma Mater Studiorum, University of Bologna: Bologna, Italy
2) Department of Economics and Business Sciences, University of Cagliari, Italy
3) Department of Rehabilitation Science, College of Health and Human Services, George Mason University, USA
4) Department of Medical Sciences and Public Health, University of Cagliari, Italy

Abstract. [Purpose] Oswestry Disability Index includes an item (Oswestry Disability Index-8) aiming to assess sexual disability associated to low back pain. The aim of this study is to investigate the percentage of participants who answered the Oswestry Disability Index-8, and the relevance and characteristics of sexual disability due to low back pain in Italian patients. [Participants and Methods] Design: multicenter retrospective analysis. Population: six hundred and ninety-seven outpatients with non-specific low back pain. Variables: pain characteristics (amount, localization, and duration of perceived pain), disability, and psychological variables (anxiety, depression, catastrophizing, kinesiophobia, pain acceptance, and pain vigilance and awareness). [Results] Seventy-seven participants (11.05%) did not answer the Oswestry Disability Index-8. The odds of being not responding to the Oswestry Disability Index-8 item appeared related to age (odds=7.50 for over 60), gender (odds=2.65 for females), and marital status (odds=2.33 for not married). Concerning the psychological variables, Activity Avoidance (coefficient=0.071), Depression (coefficient=0.068), and Rumination (coefficient=0.031) showed a positive impact on sexual disability. [Conclusion] In Italian patients, the percentage of not-responding to Oswestry Disability Index-8 was relatively low. In addition, sexual disability was related to depression, activity avoidance, and rumination.

Key words: Oswestry Disability Index, Sexual function, Spinal pain

INTRODUCTION

Sexuality plays a significant role in human life. Low Back Pain (LBP) may negatively influence sexual activity, since it can provoke physical discomfort and/or exacerbation of pain during intercourse and marked reduction in the frequency of sexual activity1–4).

Changes in sexual activity have been reported in athletes with LBP5) and in patients submitted to lumbar spine surgery. Fifty-five percent of Turkish men and 84% of women with lumbar disc herniation reported experiencing sexual problems1); in the Swedish population, 34% complained of further LBP related to sexual activity, and 30% reported that their sex life was severely limited due to LBP6). In 50% of the Japanese population, lumbar disc herniation significantly decreased sexual arousal and the frequency of sexual activity7).
The prevalence of sexual disability also seems relevant in chronic LBP patients, and it may significantly mediate the relationship between pain intensity and depressive symptoms. In the Moroccan population, 81% of chronic LBP patients complained of sexual difficulties related to LBP, whereas among Iranians, 71.1% of females complain of sexual disability, and 59.5% of males complain of erectile dysfunction.

Higher sexual function in patients with chronic LBP was observed in younger, physically active, unemployed patients. Furthermore, lower BMI, higher education level, lower duration and intensity of LBP, shorter sick leave, lesser disability, higher family income, lower levels of anxiety and depression, and higher psychical and mental functioning seemed to increase sexual activity.

In a bio-psychosocial framework, good clinical practice should include the assessment and the treatment of LBP-related sexual disability. One of the questionnaires assessing lumbar disability is the Oswestry Disability Index (ODI), which demonstrated satisfactory psychometric properties, also in several culturally adapted versions, including the Italian one. It is a self-administered 10-item questionnaire, investigating the intensity of pain and the disabling effect of LBP on daily activities. The score for each item ranges from 0 to 5, and the sum of the ten scores is expressed as a percentage of the maximum score, ranging from 0 (no disability) to 100 (maximum disability). ODI includes an item (ODI-8) on sexual activity. As the completion of this item is optional, some patients may not answer this question; nevertheless, among responders, ODI-8 was validated as having measured chronic LBP-related sexual inactivity.

The percentage of ODI-8 non-responders significantly varies among different samples, from 3% in surgical patients, to 47.7% in chronic LBP patients. To authors’ knowledge, no study was carried out on the prevalence of sexual disability due to LBP in an Italian population subjected to conservative treatment. In addition, demographic and clinical characteristics of sexually disabled subjects due to LBP were not investigated.

The primary aim of this study was to perform a retrospective analysis of previous databases on non-specific LBP in Italian patients submitted to a conservative treatment and completing the ODI-I. We aimed to investigate the percentage of who answered to the ODI-8, and the prevalence and relevance of sexual disability due to LBP. Secondarily, we aimed to analyze the relationship between sexual disability and demographic and clinical characteristics, lumbar disability, pain, and psychological factors.

**PARTICIPANTS AND METHODS**

We followed the checklist of items that should be included in articles reporting an observational study, suggested by the “STrengthening the Reporting of OBservational studies in Epidemiology” (STROBE) Statement.

This study is a multicenter retrospective analysis. The medical records of six hundred and ninety-seven outpatients with non-specific LBP submitted to a conservative treatment in three physiotherapy clinics located in northern Italy between January 1st 2014 and December 31st 2016 were retrospectively reviewed.

Inclusion criteria concerned outpatients older than 18 years, complaining of non-specific chronic LBP with or without referred pain. Exclusion criteria were previous lumbar surgery, systemic diseases (inflammation, infection, cancer, etc.), neuromuscular disorders, or cognitive deficits. All participants filled in the ODI-I at the starting of their treatment period.

Information collection concerned the ODI-I, socio-demographic characteristics (age, gender, education, etc.), pain characteristics (amount, localization, and duration of pain) and psychological variables (anxiety, depression, catastrophizing, kinesiophobia, pain acceptance, pain vigilance, and awareness), by means of scales validated in Italian. The ODI-8 item is considered a variable to investigate, and assumes the role of response variable, whereas all the other variables are considered predictors or potential confounders.

Two research assistants provided all the participants with written information concerning the questionnaires and procedures. The questionnaires used were the Tampa Scale of Kinesiophobia (TSK), the Hospital Anxiety and Depression Scale (HADS), and the Pain Catastrophizing Scale (PCS). The TSK is focused on believes in relation to pain and physical activities and is divided in two subscales: TSK 1—Activity Avoidance, and TSK 2—Harm, with total score from 13 to 52. The kinesiophobia is considered relevant if the TSK total score is 37. The HADS was developed to detect states of anxiety and depression in the setting of hospital outpatient clinics. It is composed of two 7-item scales, investigating anxiety and depression. The Italian version of 14-item total scale showed a high internal consistency and a high discriminating power for all the psychiatric disorders, with cut-off corresponding to 10 points. The PCS is a 13-item questionnaire investigating three different dimension of catastrophizing: Helplessness, Rumination, and Magnification. The maximum score is equal to 52 points; catastrophizing is considered clinically relevant if the total score is 38 points.

The sample size was established considering the general linear model. Accepting a type I error of 5% and a type II error of 20% and considering up to eleven predictors and a moderate level of variance given by the model (between 10% and 15%), it was assumed that at least 110 patients should be recruited. We were able to exceed the theoretical sample size reaching 697 patients. Nevertheless, because of the elevated costs and time-consuming procedures, psychological variables were available only for 112 patients.

A descriptive statistical analysis was conducted. Categorical data are presented as percentage, continuous data are presented as either the means and Standard Deviations (SDs) or the minimum, median and maximum. Statistical analysis was conducted by checking if the percentage of non-responders to ODI-8 was statistically different to those of the other ODI.
items in order to study the response attitude toward ODI-8. Since we were interested in understanding the influence of socio-demographic characteristics in non-responders to ODI-8 through interpretable inference, we adopt the logistic regression model using as response a binary variable of the ODI-8 item, considering 0 “no-answer” and 1 “answer”. The same method was used to investigate the relation between the unanswered ODI-8 item and the other nine ODI items.

The relationship between ODI-8 and demographic and clinical characteristics, lumbar disability, pain, and psychological factors was investigated by Pearson’s correlation index and the non-parametric Mann-Whitney U test. The analysis of the relationship between sexual disability and socio-demographic and clinical characteristics, disability, pain, and psychological variables was conducted by using regression analyses to discover potential confounding factors. Since the number of predictors inserted into the regression analysis was large, a backward selection following the Akaike information criterion (AIC) approach was adopted to select a subset of predictors, removing iteratively the least useful predictors, one at a time. When performing Pearson’s correlations, solely complete observations were considered. The data were statistically analyzed using R software, version 3.3.3.

Based on the study design, IRB approvals were previously obtained, written consent forms had already been signed, and further forms were not required. The privacy rights of participants were observed and the procedures followed were in accordance with Italian ethical standards and with the Helsinki Declaration of 1975, as revised in 2000.

**RESULTS**

Table 1 and Table 2 show the socio-demographic and clinical characteristics of the sample. Table 3 illustrates minimum, median and maximum of single ODI-items, whereas Table 4 shows minimum, median and maximum of psychological variables. Seventy-seven participants did not answer ODI-8, corresponding to 11.05% of the whole sample. This percentage was statistically higher (p<0.05) than other ODI items (range 0 to 0.29%).

Concerning the influence of the demographic characteristics of those who did not answer ODI-8, the odds of being not-responding to the ODI-8 item appeared significantly and directly related to age, gender, and marital status. The odds are

| Table 1. Qualitative socio-demographic characteristics of the study population (n=697) |
| Variable          | No.  | %   |
|-------------------|------|-----|
| Gender            |      |     |
| Female            | 420  | 60  |
| Male              | 277  | 40  |
| Marital status    |      |     |
| Unmarried         | 243  | 35  |
| Married           | 454  | 65  |
| Employment        |      |     |
| Workers           | 518  | 74  |
| Not workers/students | 127 | 18  |
| Retired           | 52   | 8   |
| Education         |      |     |
| Elementary school | 21   | 3   |
| Middle school     | 104  | 15  |
| High school       | 323  | 46  |
| University        | 249  | 36  |
| Smoking           |      |     |
| Yes               | 173  | 25  |
| No                | 524  | 75  |
| Presence of referred pain |  |     |
| Yes               | 361  | 52  |
| No                | 336  | 48  |
| Age in classes    |      |     |
| 18–40             | 206  | 30  |
| 41–60             | 353  | 50  |
| Over 60           | 138  | 20  |

| Table 2. Quantitative socio-demographic characteristics of the study population (n=697) |
| Variable          | Mean  | Standard Deviation |
|-------------------|-------|---------------------|
| Age (years)        | 48.20 | 13.99               |
| Body Mass Index (kg/m^2) | 24.26 | 3.88               |
| Duration of pain (months) | 22.22 | 39.54               |
| Disability (Oswestry Disability Index) | 20.79 | 13.63               |

| Table 3. Oswestry Disability Index items of the study population (n=697) |
| Item                          | Min | Median | Max |
|--------------------------------|-----|--------|-----|
| Item 1 - Pain Intensity       | 0   | 2      | 5   |
| Item 2 - Personal care (washing, dressing, etc.) | 0 | 0 | 4 |
| Item 3 - Lifting              | 0   | 1      | 5   |
| Item 4 - Walking              | 0   | 0      | 5   |
| Item 5 - Sitting              | 0   | 1      | 5   |
| Item 6 - Standing             | 0   | 1      | 5   |
| Item 7 - Sleeping             | 0   | 1      | 5   |
| Item 8 - Sexual life (if applicable) | 0 | 0 | 5 |
| Item 9 - Social life          | 0   | 1      | 5   |
| Item 10 - Travelling          | 0   | 1      | 5   |
Table 4. Psychological variables of the study population (n=112)

| Variable                        | Min | Median | Max |
|---------------------------------|-----|--------|-----|
| PVAQ-Basal- passive awareness   | 4   | 21     | 33  |
| PVAQ-Basal-active vigilance     | 1   | 11     | 30  |
| PCS-Helplessness                | 0   | 5      | 19  |
| PCS-Rumination                  | 0   | 8      | 20  |
| PCS-Magnification               | 0   | 2      | 8   |
| TSK-Harm                        | 0   | 11     | 24  |
| TSK-Activity avoidance          | 0   | 15     | 27  |
| CPAQ-Basal-activities engagement| 16  | 44     | 63  |
| CPAQ-Basal-pain willingness     | 1   | 25     | 48  |
| HADS-Anxiety                    | 0   | 5      | 21  |

PVAQ: Pain Vigilance and Awareness Questionnaire; PCS: Pain Catastrophising Scale; TSK: Tampa Scale for Kinesiophobia; CPAQ: Chronic Pain Acceptance Questionnaire.

Table 5. The odds of being not-responding to the ODI-8 item on the demographic characteristics

| Variable               | Odd  | p-value |
|------------------------|------|---------|
| Age in classes (41–60) | 1.87 | 0.097   |
| Age in classes (Over 60)| 7.51 | <0.001  |
| Gender (Female)        | 2.65 | 0.001   |
| Marital status (Unmarried) | 2.33 | 0.002   |

Table 6. The coefficients of the model explaining disability

| Variable               | Coefficient | p-value |
|------------------------|-------------|---------|
| (Intercept)            | 7.70        | 0.002   |
| ODI-8                  | 9.10        | <0.001  |
| Gender (Female)        | 1.72        | 0.022   |
| Marital status (Married)| 2.21   | 0.005   |
| Smoking (No)           | -1.44       | 0.087   |
| Body Mass Index        | 0.14        | 0.137   |
| Duration of pain       | 0.02        | 0.012   |
| Presence of referred pain (Yes) | 2.55 | <0.001  |

Table 7. The coefficients of the model explaining ODI-8

| Variable               | Coefficient | p-value |
|------------------------|-------------|---------|
| (Intercept)            | -0.870      | <0.001  |
| TSK-Activity Avoidance | 0.071       | 0.002   |
| HADS-Depression        | 0.068       | 0.003   |
| PCS-Rumination         | 0.031       | 0.087   |

illustrated in Table 5, specifically they were 7.50 (p<0.001) for people over 60 years old when compared to those under 40, 2.65 (p<0.001) for females when compared to males, and 2.33 (p<0.002) for unmarried when compared to married. On the contrary, when investigating the relationships between not-responding to ODI-8 and the other nine items, significant odds ratios directly emerged for walking disability (ODI-4: OR=1.54, with p=0.008) and, to a lesser extent, for pain intensity (ODI-1: OR=1.34, with p=0.067), whereas avoiding to answer ODI-8 was inversely related to the personal care disability (ODI-2: OR=0.71, with p=0.079).

The relationships between ODI-8 and the following characteristics were investigated: gender, age divided into classes, marital status, work, education, smoking, body mass index (BMI), disability, amount and duration of LBP, and presence of referred pain. Disability, gender, BMI, duration and frequency of pain were variables non-independent from sexual disability evaluated through ODI-8. The only statistically significant linear relationships between these variables and sexual disability emerged when disability was measured for the whole scale (Pearson’s coefficient=0.72). The relationships between ODI-8 and disability, and the following characteristics were investigated: gender, age divided into classes, marital status, work, education, smoking, body mass index (BMI), disability, amount and duration of LBP, and presence of referred pain. Disability, gender, BMI, duration and frequency of pain were variables non-independent from sexual disability evaluated through ODI-8. The only statistically significant linear relationships between these variables and sexual disability emerged when disability was measured for the whole scale (Pearson’s coefficient=0.72).

To analyze the relationships between ODI-8 and disability, disability was considered a dependent variable and ODI-8 a predictor while gender, age in classes, marital status, employment, education, smoking, BMI, presence of referred pain and duration of pain were confounder predictors. The backward selection removed three confounder predictors from the final model: smoking, BMI, and presence of referred pain. PTSD and depression were variables non-independent from sexual disability evaluated through ODI-8. The only statistically significant linear relationships between these variables and sexual disability emerged when disability was measured for the whole scale (Pearson’s coefficient=0.72).

Concerning the relationships between sexual disability and psychological variables, TSK-Activity Avoidance and HADS-Depression had a similar positive impact on sexual disability (Table 7). Their impact is statistically significant (p<0.01), with coefficient equal to 0.071 and 0.068, respectively; PCS-Rumination was the third factor selected through the backward selection approach and its impact was positive (0.031, with p=0.087).

**DISCUSSION**

The ODI-8 resulted largely the most unanswered item, perhaps because of the intimate nature of the topic, or because...
sexual life may not concern all people filling in the ODI, differently from other daily life activities.

The percentage of non-responders was relatively low (11.05%), fewer than the 47.69% found in chronic LBP patients, but higher than the 3% found for surgical patients, showing that a relevant difference between different samples exists. By analyzing the characteristics of patients who did not respond to ODI-8, the odds were significantly higher in those over 60, females, unmarried patients, and in subjects with difficulties in walking and high pain intensity. Similarly, Costa et al. found that ODI-8 not-responding were mostly females and older people.

Among the responders, 63% of our sample declared the absence of any LBP-related sexual problems, whereas 37% reported some kind of disorder/difficulty. Only 7% answered that their sexual life was strongly limited by pain. Among all the severely limited participants, females were the triple of males. Previous studies also reported higher prevalence of sexual disability in female patients, probably due to the different location as our study was carried out in a conservative setting, whereas other studies have been performed in a surgical setting.

In our study, the only statistically significant correlation between ODI-8 and other characteristics resulted with lumbar disability. The highly significant relationship between sexual disability (assessed with ODI-8) and lumbar disability (assessed with the entire ODI) is in line with the results of a previous study validating ODI-8 as an assessment of LBP-mediated sexual activity.

In our sample, sexual disability was significantly related not only to pain, but also to depression, activity avoidance, and rumination. These findings are coherent with previous studies, in which higher levels of depression and anxiety and poor quality of life were significantly associated to sexual functioning in both males and females with chronic LBP. It is suggested that the pathway from pain to depression is through the disruption of social and relational function. The interruption of normal social/sexual relationships due to pain intensity may be associated with higher depressive symptoms, and lower quality of life.

In a psychosocial model, clinicians should consider sexual disability in the assessment and management of LBP, both in surgical and in conservative settings. Clinicians may explain which positions are more inclined to generate pain and which are more comfortable for sexual activity. Unfortunately, healthcare practitioners frequently do not discuss this topic with their patients, and/or they are not always able to properly interpret this kind of disability in patients complaining of LBP.

In this retrospective study we did not submit specific questionnaires for sexual dysfunction to patients. In addition, the correlation with psychological aspects was investigated only on a part of our sample. Other limits to our study concern the generalization of the results, because our sample was composed of participants with a medium-high level of instruction, residents in northern Italy, therefore we don’t know if our conclusions could be applied to all Italian patients with chronic LBP. Moreover, a different study design (i.e. qualitative study based on interviews) should be used to investigate the subjective perception about sexual disability and its implications in personal and social life.

Our study demonstrated that sexual life is a relevant topic for most Italian patients and a significant part of these complained of some form of pain affecting their sexual life as per other countries. From a clinical point-of-view, due to its simplicity and speed of administration, we suggest using the ODI to call attention to information also regarding sexual disability in LBP patients. In the case of reported disability, further questionnaires should be employed to deepen our understanding of sexual dysfunctions (i.e. the Female Sexual Function Index for females, and the International Index of Erectile Function for males).

Conflict of interest
None.

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