
PSYCHOLOGICAL STRESS PERCEPTION IN PATIENTS SUFFERING FROM CROHN DISEASE ACCORDING TO SAMPLING CHARACTERISTICS: A COHORT OBSERVATIONAL STUDY

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Abstract

The present study aimed to investigate how patients suffering from Crohn disease felt themselves as psychologically supported and if psychological stress perception could vary according demographic characteristic.

An on-line, observational, cross sectional study was carried out by publicizing the questionnaire created through social networks from October 2021 to February 2022.

A total of 785 participants were enrolled in the present study. Of these, no significant differences were reported between subjects who felt themselves as psychologically supported and subjects who did not feel as psychologically supported. By considering all the sampling characteristics collected and the stress perceived levels, only with reference to sex, significant association was found ($p=.021$).

The present study revealed compromised aspects of the quality of life in patients suffered from Crohn disease and its related psycho-physical sequelae, which allowed to lay the foundations for further studies, studying the comorbidity of this disease with other factors, too.

Keywords: Age; Crohn Disease; Educational Level; Inflammatory Bowel Disease; Marital status; Patient; Occupational level; Stress perception; Sex.

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1. Introduction

Crohn Disease (CD) is a chronic disease that causes inflammation and irritation of the digestive system, by particularly affecting the small intestine and the beginning of the large intestine, by also affecting any portion of the digestive system, too. It is one of the Chronic inflammatory bowel diseases (IBD), which also includes ulcerative colitis and microscopic colitis, gradually arising and tending to worsen over time with periods of remission involving organs and extra intestinal tissues, such as: musculoskeletal and dermatological systems, renal, hepato-pancreatic-biliary, pulmonary and ocular (Annese, 2019), in 25-40% of cases (Hoilat & Rentea, 2021). Symptoms could suddenly appear and the cause of the disease is still unknown today (Dulai et al., 2020): from genetic to environmental, immunological, dietary and lifestyle factors have been proposed. The most accepted hypothesis is that the IBD is an autoimmune disease that is linked to an abnormal immunological reaction on the part of the intestine of genetically predisposed subjects towards certain stimuli normally present in the intestine. In fact, under normal conditions, the immune response of the intestine is characterized by a balance between pro-inflammatory and anti-inflammatory factors. Recent estimates show that over 5 million people worldwide are affected by Chronic IBD, of which approximately 1.6 million in North America and nearly 3 million in Europe. In Italy the estimated incidence is around 3.7-4.2 / 1,000,000 / year, without gender differences, the prevalence is 50-54 / 100,000 (Biancone & Vernia, 2018). Diet and lifestyle modifications could help control the symptoms of inflammatory bowel disease including CD, too. An established risk factor linked to lifestyle is smoking (Kaplan & Ng, 2017; Piovani et al., 2019). In particular, it has been shown how cigarette smoking alters cell proliferation, endothelial function and the immune response not only of the respiratory and cardiovascular system, but also of the gastrointestinal tract (Berkowitz et al., 2018), predisposing to the development of neoplasms with a percentage of 2.20%; for active smoking and 1.87% for second hand smoke (Soon et al., 2012; Ananthakrishnan, 2015; van der Sloot et al., 2021). Other factors, such as: the use of oral contraceptives, the use of antibiotics, the regular use of non-steroidal anti-inflammatory drugs and the urban environment contribute to the onset of the disease, even homozygosity for the NOD2 gene has shown an increased risk 20 to 40 times of developing CD (Ananthakrishnan, 2015). Dietary risk factors that could increase the risk of developing IBD include: high consumption of saturated fat and monosaccharides and low fiber intake, too (Riordan et al., 1998; Owczarek et al., 2016; Basson, 2012). CD involves important psycho-physical sequelae among those affected by it, by generating the inability to exercise control over their intestinal functions, with a strong impact on the social sphere. This leads the patient to reformulate all their daily plans, with great compromise in the quality of life. Work, relationships and leisure time activities cannot be managed in an orderly and

serene manner: in most cases, the patient gives up most of these things, often facing social isolation and a strong sense of guilt, resulting from constant refusals to social commitments and strong stress that generates a strong link between stress and somatic disease (Agostini et al., 2017) which also affects the nervous system, too (Petraro et al., 2019). Even the numerous surgeries to which people suffering from CD undergo deteriorate the quality of life, just think of the presence of intestinal ostomies which could alter the perception of the body image with important psychological consequences (Gecse et al., 2014; Kappelman et al., 2008; Abraham & Cho, 2009; Khor et al., 2011; Abdalla et al., 2016). 70% of IBD patients believe that stress or their personality traits significantly contribute within a biopsychosocial disease model, the altered gut-brain axis could influence the course and development of the disease and lead to psychological symptoms, such as: Chronic abdominal pain, anxiety and depression, delivering severe emotional stress factors (Matos et al., 2021). Therefore, over time, both social and affective dimensions are worn down by these experiences of suffering: this could lead to real forms of psychological distress, such as anxiety experiences or depressed mood, one out of three patients is in fact affected by symptoms of anxiety and one in four from symptoms of depression (Barberio et al., 2021). It is necessary to pay more attention to the psychological factors and to the sequelae that this disease implies (Song et al., 2020). A study conducted in Brazil found that moderate to severe active disease has a strong impact not only on quality of life, but also on job performance (Parra et al., 2019; Neovius et al., 2013). Predominant lifestyle among IBD patients is the attachment style, which describes the type of bond an individual has with others, particularly with contact persons, such as parents. Attachment style is an important influencing factor for interpersonal functioning and stress. In this regard, studies have shown that individuals with a fearful and worried attachment style have a negative view of themselves, resulting in high levels of dependence on important people and low self-esteem (Engel et al., 2021). Furthermore, several studies have shown that patients with IBD record high levels of emotional distress and poor quality of life (Iglesias et al., 2009). It is interesting to understand how the person suffering from CD perceives and manages its own psycho-physical sequelae implying by the disease; its relating coping strategies and supporting sources, too. Additionally, a link between IBD and mental health problems was found on suicide, mood, anxiety (Walker et al., 2008; Vigod et al., 2019) and psychotic disorders (Eaton et al., 2010). Therefore, adult-onset IBD has been associated with an increased risk of psychiatric disorders and suicide attempts, by highlight the importance in psychological follow-up within the first year after IBD diagnosis (Ludvigsson et al., 2021), through a multidisciplinary approach that involves several healthcare professionals, in order to identify alternative points of view and solutions to the problems highlighted.

1.1 Aim

The present study aimed to investigate among CD patients their related perceptions on psychological stress according to their demographic characteristics, like sex, age, marital status, educational level, occupation, age of disease, stress perceived.

2. Materials and Methods

2.1 Design

An on-line, observational, cross sectional study was carried out by publicizing the questionnaire through social networks, such as Facebook groups, namely: “CD, ulcerative colitis, virtual community”, “Crohn Disease”, “Intestinal wellness and nutrition”.

After receiving permission by each administer of each Facebook page, the questionnaire was publicized and an active link was posted in order to facilitate its compilation in a period of time between October 2021 and February 2022.

2.2 Sampling

All subjects affected by CD, who voluntary agreed to participate in the present study signed the informed consent. On the other hand, all subjects affected by ulcerative colitis were excluded from the study.

2.3 Questionnaire

In the first part of the questionnaire, demographic data were collected, by referring to all the above mentioned literature searched (Ananthakrishnan, 2015; Walker et al., 2008; Vigod et al., 2019; Kaplan & Ng, 2017; Piovani et al., 2019), specifically:

- sex, as female or male;
- age in years, divided into groups, as: until 20 years, 31-40 years, 41-50 years, 51-60 years, over 61 years;
- marital status, as single, married, divorced, or separated, widowed;
- education level between: junior high, high school diploma, college degree, post-graduate education, or none;
- occupational condition, including: student, homemaker, employee, government employee, freelancer, retiree, other not specifically mentioned above;
- how long has the patient known about CD, as: until 1 years, until 5 years, 6-10 years, 11-15 years and over 16 years;

- total weight decrease in the course of the CD: between 0-5kg, between 5-10kg, between 10-20kg or more than 20 kg.

Then, in the second part of the questionnaire it was investigated if participants felt themselves psychologically supported or not and then, the dimension of perceived stress was explored thanks to the "Perceived Stress Scale," consisting of a total of 10 items that focused on the participant's feelings during the past month. The Perceived Stress Scale (Cohen, 1998; Henry & Crawford, 2005), validated in Italian, is used to assess the perception of each of us when faced with situations of daily life and our reaction in response to these events, which can be perceived as destabilizing and can therefore create a state of risk for us. The questionnaire consists of 10 questions, with a value ranging from 1 to 5 depending on the severity of the disturbance caused and the evasion implemented to circumvent the situation 0 = Never 1 = Almost never 2 = Sometimes 3 = Fairly often 4 = Very often.

2.4 Ethical Concerns

In the first part of the questionnaire it was clearly posted ethical considerations. Participation in the study, being free and voluntary, was considered an expression of consent. Those interested in participating were presented with the opportunity to express informed consent and the confidentiality and anonymous nature of the information was guaranteed according to the Declaration of Helsinki principles. The present study was approved by the Ethical Committee of Policlinic in Bari, Italy, with approval no. 7041/2021.

2.5 Data Analysis

All data collected were classified as categorical variable and presented as frequencies and percentages. The chi-square test was performed between all sampling characteristics according to their perceptions on psychological support. Then, linear regression was assessed between the stress level perception and each sampling characteristics in order to explore which variable was significantly associated to the perception level condition. All p-values < .05 were considered as statistical significant.

3. Results

A total of 785 participants were enrolled in the present study. Of these, no significant differences were reported between subjects who felt themselves as psychologically supported and subjects who did not feel as psychologically supported, too. Table 1 showed all frequencies and percentages of participants according their psychological support feeling condition according to their sampling

characteristics. Therefore, it seemed that the psychological supportive condition seemed to be not influenced by all the sampling characteristics collected ($p>.05$).

Table 1. Demographic characteristics among participants according to their psychological support perception ($n=785$).

<i>Sampling characteristics</i>	<i>Psychological support</i>		<i>p-value</i>
	<i>Yes n(%)</i>	<i>No n(%)</i>	
<i>Sex</i>			
Female	84(10.70)	513(65.40)	.131
Male	35(4.50)	153(19.50)	
<i>Age</i>			
Until 20 years	9(1.10)	36(4.60)	.453
21-30 years	27(3.40)	177(22.50)	
31-40 years	33(4.20)	193(24.60)	
41-50 years	21(2.70)	140(17.80)	
51-60 years	23(2.90)	88(11.20)	
Over 61 years	6(0.80)	32(4.10)	
<i>Marital status</i>			
Single	56(7.10)	340(43.30)	.257
Married	49(6.20)	264(33.60)	
Divorced / Separate	14(1.80)	52(6.60)	
Widower	0(0)	10(1.30)	
<i>Educational level</i>			
Junior high school	22(2.80)	106(13.50)	.512
Diploma	62(7.90)	312(39.70)	
Degree	27(3.40)	194(24.70)	
Post-graduation	8(1.00)	50(6.40)	
None	0(0)	4(0.50)	
<i>Occupation</i>			
Student	3(0.40)	5(0.60)	.060
Housewife	0(0)	15(1.90)	
Subordinate worker	109(13.90)	622(79.20)	
Public employee	4(0.50)	10(1.30)	
Freelancer	0(0)	8(1.00)	
Retired	2(0.30)	5(0.60)	
More	1(0.10)	1(0.10)	
<i>Age-disease</i>			
Until 1 year	0(0)	6(0.80)	.543
2-5 years	2(0.30)	13(1.70)	
6-10 years	0(0)	4(0.50)	
11-15 years	43(5.50)	203(25.90)	
Over 16 years	74(9.40)	440(56.10)	
<i>Perceived Stress (PSS scale):</i>			
Low			.232
Moderate	2(0.30)	6(0.80)	
High	76(9.70)	379(48.30)	
	41(5.20)	281(35.80)	

Note. * $p<.05$ is statistical significant.

By considering all the sampling characteristics collected and the stress perceived levels (Table 2), only with reference to sex, significant association was found ($p=.021$). In fact, females reported higher levels in stress perception than males, both in moderate (females: 42.70% vs males: 15.30%) and in high perception levels, too (females: 32.90% vs males: 8.20%). No further significant associations were assessed.

Table 2. Associations between stress perceived levels according to demographic characteristics

Sampling characteristics	Stress Perceived			B	t	p-value
	Low n(%)	Moderate n(%)	High n(%)			
Sex						
Female	4(0.50)	335(42.70)	258(32.90)	-.083	-2.313	.021*
Male	4(0.50)	120(15.30)	64(8.20)			
Age						
Until 20 years	0(0)	24(3.10)	21(2.70)	-.074	-1.538	.125
21-30 years	1(0.10)	123(15.70)	80(10.20)			
31-40 years	2(0.30)	130(16.60)	94(12.00)			
41-50 years	0(0)	84(10.70)	77(9.80)			
51-60 years	3(0.40)	74(9.40)	34(4.30)			
Over 61 years	2(0.30)	20(2.50)	16(2.00)			
Marital status						
Single	3(0.40)	235(29.90)	158(20.10)	.048	1.041	.298
Married	5(0.60)	174(22.20)	134(17.60)			
Divorced	0(0)	39(5.00)	27(3.40)			
Separate	0(0)	7(0.90)	3(0.40)			
Widower						
Educational level						
Junior high school	3(0.40)	69(8.80)	56(7.10)	-.020	-.566	.572
Diploma	5(0.60)	214(27.30)	155(19.70)			
Degree	0(0)	136(17.30)	85(10.80)			
Post-graduation	0(0)	32(4.10)	26(3.30)			
None	0(0)	4(0.50)	0(0)			
Occupation						
Student	0(0)	2(0.30)	6(0.80)	.013	.352	.725
Housewife	1(0.10)	6(0.80)	8(1.00)			
Subordinate	7(0.90)	431(54.90)	293(37.30)			
worker	0(0)	8(1.00)	6(0.80)			
Public employee	0(0)	4(0.50)	4(0.50)			
Freelancer	0(0)	4(0.50)	3(0.40)			
Retired	0(0)	0(0)	2(0.30)			
More	0(0)	0(0)	0(0)			
	0(0)	0(0)	0(0)			

Sampling characteristics	Stress Perceived			B	t	p-value
	Low n(%)	Moderate n(%)	High n(%)			
<i>Age-disease</i>						
Until 1 year	0(0)	6(0.80)	0(0)	.011	.290	.772
2-5 years	0(0)	8(1.00)	7(0.90)			
6-10 years	0(0)	3(0.40)	1(0.10)			
11-15 years	0(0)	139(17.70)	107(13.60)			
Over 16 years	8(1.00)	299(38.10)	207(26.40)			
<i>Psychological support</i>						
Yes	2(0.30)	76(9.70)	41(5.20)	.056	1.571	.117
No	6(0.80)	379(48.30)	281(35.80)			

Note. *p<.05 is statistical significant.

4. Discussion

The present study aimed to investigate how patients suffering from CD felt themselves as psychological supported and if psychological stress perception could vary according to demographic characteristic. CD, which is on the rise heavily affects the quality of life of patients, often influencing their relational, social and state abilities (Roda et al., 2020). In the present, 785 participants suffering from CD were enrolled in this study, with a female prevalence (76.10%). The overall average age of the responders was 38 ± 12 years, while the discovery of the disease was around 26 ± 11 years. Disease onset at a young age in most cases requires prompt but long-term treatment to prevent flare-ups and disease progression (Roda et al., 2020). The morbidity associated with the disease have the potential to profoundly affect patients, especially in adolescence, not only physically, but also through limitations in social, educational, professional and emotional activities, generating a negative perception of oneself and the surrounding environment. The present results showed that the majority of the sample recruited (84.1%) reported moderate and high stress levels, aged between 21-30 (22.30%) and 31-40 (24.60%) years, did not require psychological support. Among the psychological determinants, literature highlighted how stressful events, lower socio-economic status, ethnicity, persistent anxiety and depression conditions led to an acceptance of negative quality of life, such as feeling affected patients as unsuitable and misunderstood from IBD, especially among females (Leone et al., 2019). In fact, the latter showed greater concerns relating to the CD than the males: they were afraid in feeling burden, in being treated differently because the disease and the feeling less accepted their body image. These findings were in agreement to our study, in which females reported higher levels ($p=.021$) in moderate stress than males (females: 42.70% vs males: 15.30%) as well as high levels of stress (females: 32.90% vs males: 8.20%). From

the sample recruited it emerged that the majority of subordinate workers' recorded from moderate (54.90%) to high (37.3%) stress. A study conducted in Switzerland found that the majority of IBD patients with full-time jobs experienced high levels in work-related stress (Schreiner et al., 2017). The most important health determinants for CD patients concerned aspects of the world of work, such as job satisfaction and occupational balance, as also highlighted in the study by van Gennep et al. (2020), in which a strong positive association between quality of working life (QWL) and health-related quality of life (HRQL) was found, particularly in 63% of patients presented problems related to fatigue at work, 48% agreed to be obstructed at work. Occupational stress also appeared to have an association with the CD diagnosis (OR: 3.023, 95% CI: 1.413-6.469) (Chadolias et al., 2017). Individuals with a higher education level, high school graduates, reported moderate or high levels of stress, in line with the Wu et al. study (2022). From a study conducted in Korea, 24 IBD patients and 66 patients with ostomy were enrolled, mean total depression and resilience scores in UC were registered. Depression in patients with ostomy was associated also with economic status, sleep disturbance, and sleep time and marital status ($t=2.27$; $p=0.027$). The singles enrolled in the greatest number within our study recorded high (20.10%) and moderate (29.90%) levels of anxiety. The Freitas et al. (2015) study showed how anxiety mediated the sense of coherence with physical, mental and social relationships. In particular, the female gender seemed to be the one most associated with concerns related to self-image and relationships, as well as sexual performance and intimacy (Armuzzi et al., 2019). In fact, moderate (22.20%) and high (17.60%) stress was also registered in the married sample. 70% of IBD patients believe that stress and their own personalities contribute significantly within a biopsychosocial disease model: the altered gut-brain axis could influence the course and development of the disease and lead to psychological symptoms, such as: Chronic abdominal pain, anxiety and depression; as well as inducing a local inflammatory response in the gastrointestinal tract, increasing intestinal permeability and modifying hypersensitivity and visceral motility, too (Peppas et al., 2021). Emotional stress particularly affected the quality of life in these patients (Matos et al., 2021). A review of the literature showed that IBD patients had approximately a 20% prevalence rate of anxiety and a 15% prevalence rate of depression (Neuendorf et al., 2016). Psychological distress increased morbidity in ulcerative colitis and CD, with impaired inter-family and social relationships (Slonim-Nevo et al., 2017). Patients were emotionally more vulnerable, prone to disturbance because they were unable to reach an adequate resolution of their problems. This determined the presence of depressive conditions, as well as other characteristics, such as: restlessness, irritability, impatience and inability to remain inactive, confirming the hypothesis of the high levels of anxiety that characterize them. Therefore, it would be advisable to direct patients suffering from this pathology to follow psychological support paths (Matos et al., 2021), in order to have positive effects on the acceptance of the disease, as well as excellent

results on the quality of life from a physical, psychological point of view and social. IBD is linked to psychiatric morbidity, but few studies have evaluated general population comparators. In adults, it has been associated with an increased risk of psychiatric disorders and suicide attempts (Ludvigsson et al., 2021), although an aspect little discussed in the literature should be monitored: the increased risk of suicide attempts among adolescents (Butwicka et al., 2019). This scenario indicated that long-term psychological support was considered for IBD patients with childhood-onset. In Sweden, a cohort study for 9 years, in a population of 6,464 people with a diagnosis of childhood-onset IBD (2,831 girls and 3,633 boys; average age 13 ± 4 years, it was possible to ascertain a diagnosis of psychiatric disorder (11.8%) with suicide attempts, mood disorders, anxiety disorders, eating disorders, autism spectrum disorders, attention deficit / hyperactivity disorder (Butwicka et al., 2019). Loftus et al. (2011), highlighted that patients with childhood-onset IBD were at increased risk for both anxiety disorders. Another study in 248 patients only highlighted the risk of depression with a median follow-up of only 3.1 years, during which only 8 patients received antidepressants (Virta et al., 2014). Consequently, IBD patients experience a sense of isolation and social stigma that tends to worsen their qualities of life. For these reasons, it might be important for patients to find the strength to openly speak about their conditions and needs. Certainly the disease typology sometimes embarrassing consequences that could make the path of acceptance very difficult, which is fundamental at the same time, too. In this sense, aid associations play a very important role in supporting patients in more practical matters and in providing them with assistance, which also translates into psychological support. Cognitive-behavioral therapy is now considered a standard, in terms of effectiveness, mood disorder management. Cognitive-based therapies dedicated to trauma processing are also very useful in overcoming the initial shock of diagnosis (Korzenik, 2019). The first step to overcome embarrassment and manage the distrust of others is in fact to accept the Chronic nature of these diseases. Only in this way we could look with greater confidence at therapies, which today allow conditions of well-being that were unthinkable until a few years ago, and at our own future. Once a psychological equilibrium has been found, it is easier for patients to affirm their needs even at work and to talk about their conditions with more serenity, so as to gradually break down the wall of stigma that still surrounds IBD (Taft, 2009; Taft & Keefer, 2016) avoiding its related serious consequences, as suicide or suicide attempts, too.

4.1 Limitations and future perspectives

Although the present study explored how patients suffering from Crohn disease felt themselves as psychologically supported and if psychological stress perception could vary according sampling characteristic, several limitations need to be acknowledged. First, this survey used a cross-sectional design, which leads to the

inability to infer causality. Longitudinal studies could be more appropriate in future studies. Then, this study only assessed individual variables of junior high school students; future studies could take into account also social and environmental factors and contextual variables. Finally, we over-relied on self-report data, which could be vulnerable to social desirability bias, therefore, future studies will collect information from multiple informants.

5. Conclusions

The present study revealed compromised aspects of the quality of life in patients suffered from CD and its related psycho-physical sequelae, which allowed to lay the foundations for further studies, studying the comorbidity of this disease with other factors, too. Future randomized controlled trials will investigate the correlation between eating disorders, suicide and CD, a potential linkage that is not well understood in the literature and in the Italian context, too. It should not be forgotten that, in view of their chronicity and low mortality, the real challenge for health professionals could be considered the trajectory on quality of life rather than on the duration of the disease.

Authors' Notes

Data were not presented elsewhere.

Conflict of interests: None.

Authors contributions: Conceptualization: E.V., R.L.; Data curation: D.S., A.M., L.C.; Formal Analysis: E.V.; Funding acquisition: None, Investigation: R.L., D.S., A.M., L.C.; Methodology: E.V.; Project administration: R.L., D.S.; Writing – original draft: E.V., R.L. A.L.; Writing – review & editing: E.V.

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