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Too Many Couch Potatoes Among Middle-Aged Inflammatory Bowel Disease Patients: Findings from the "BE-FIT-IBD-2" Study

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Abstract: Background: Regular physical activity (PA) is desirable, regardless of age, even in patients with chronic conditions such as inflammatory bowel disease (IBD). Aims: This study aims to assess PA levels and related barriers/facilitators in IBD patients, stratifying them into age groups (with a threshold of 50 years). Methods: The International PA Questionnaire (IPAQ) assessed PA levels regarding resting metabolic rate (Met) in minutes per week (min/wk). Patient-reported outcomes 2 (PRO-2) evaluated disease activity. Results: Among the 237 enrolled patients, PA rates were found to differ significantly in terms of patients being sufficiently active (55% vs. 39.8%), inactive (39.6% vs. 59.1%), and engaging in health-enhancing PA (5.4% vs. 1.1%) between patients under and at least 50 years old, respectively ($p < 0.001$). Overall, PA levels followed this trend, being higher in younger patients [892 (446.5–1439) vs. 545.25 (257–1210.47) Met min/wk, $p = 0.007$]. Individuals aged at least 50 years tend to have lower PA at regression analysis (OR: 3.302, $p = 0.018$). Patients aged at least 50 years perceived IBD as more of a barrier to PA ($p = 0.04$). Bowel urgency is a significant barrier, especially in older patients ($p = 0.022$). Conclusions: Age is an unmodifiable factor impacting and influencing PA levels. Strategies to recover exercise levels in older IBD patients should be encouraged.

Keywords: inflammatory bowel disease; physical activity; age; quality of life; IPAQ; elderly

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1. Introduction

The medical management of inflammatory bowel disease (IBD), comprising ulcerative colitis (UC) and Crohn's disease (CD), with the advent of the biological era and the continual introduction of new therapeutic tools in the available arsenal, has led to a progressive raising of the bar for the outcomes that therapy must achieve. This has culminated in the current concept of "disease clearance", which defines complete control of the disease with an overlap of the patient's quality of life with that of the general population [1].

As a direct consequence, the scope of action of the specialist in IBD must also include other determinants of quality of life that are not specifically gastroenterological, such as mental health or regular physical activity (PA). As the World Health Organization recommends, PA should be suggested to patients with disabilities proportionally to individual tolerance and capabilities [2]. Nevertheless, clear and widespread recommendations regarding PA are lacking in international consensus and guidelines for managing IBD [3]. Consequently, this outcome has been addressed and weighed in a heterogeneous manner.

The decreasing tendency to exercise regularly as one ages is a significant health issue that must be addressed to prevent depriving older patients of the metabolic and extra-metabolic benefits that PA can provide [4]. This is particularly relevant in settings such as

IBD, where PA could be a possible measure of frailty and sarcopenia, conditions to which these patients are easily exposed [5].

Furthermore, it is not known which environmental and IBD-related factors influence patients to engage in regular PA. In one of the most extensive available studies (i.e., the "BE-FIT-IBD" study), we recently assessed PA levels in a sample of 219 patients, revealing that a significant proportion of patients (42.9%) were alarmingly completely inactive [6]. Ultimately, it appeared that among the fears we highlighted, the diagnosis of IBD emerged as a negative conditioning factor for regular exercise [6]. Among the factors we found, there was also a role of patients' social network (including family and friends), as well as the presence of a potential partner, as their influence (both encouraging and discouraging) could impact overall levels of PA [7].

This secondary analysis of the extended version of the "BE-FIT-IBD" study (i.e., the "BE-FIT-IBD-2" study) aims to verify whether age group is a discriminating or influential factor on the levels of PA in patients with IBD and to identify any barriers or facilitators existing in the relationship between this age stratification and PA levels.

2. Materials and Methods

2.1. Study Design, Setting, and Ethical Considerations

This study has an observational, cross-sectional design and is an extended version of the "BE-FIT-IBD" study [6]. This secondary analysis is more extensive than the previous study, as it included a larger patient sample and specifically examined how middle age, defined as 50 years and above, influences PA levels. This cut-off, identified arbitrarily rather than *a priori* (as this is a secondary analysis), focusing on middle age and 50 years, draws its rationale from the absence of clear previous studies or guidelines addressing a preferred age cut-off for stratifying heightened attention to PA levels in the IBD population. In the general population, it is well established that the "second 50 s" [8] represent a critical period during which PA should be encouraged and maintained for health benefits, as large population data highlight that individuals in their fifties face a significantly increased risk of sedentary behaviour [8,9].

The study was conducted within the Hepatogastroenterology division of the University of Campania Luigi Vanvitelli between March 2023 and March 2024. It received approval from the ethical committee of the University of Campania Luigi Vanvitelli with protocol number 7892 on 15 March 2023. The study was conducted in full compliance with the Helsinki Declaration.

Consecutive two hundred and thirty-seven patients with IBD (confirmed histological diagnosis [10]) and non-severe disease activity were selected using *a priori* non-invasive stratification. For this purpose, the partial Mayo score (i.e., PMS) [11] was used for patients with UC, while the Harvey–Bradshaw index (i.e., HBI) [12] was used for patients with CD. Therefore, only patients with a partial Mayo score < 8 or a Harvey–Bradshaw index < 17 were admitted and included.

In these selected patients, a rigorously anonymous multi-step online questionnaire was administered following the acquisition of informed consent. This questionnaire aimed to assess the study's variables of interest. The questionnaires could be submitted and finalised by the patient only when completed in their entirety, thus eliminating the possibility of generating missing data for this study.

Several exclusion criteria accompanied the inclusion as mentioned in the above criteria, including a diagnosis of psychiatric disorders, recent surgery (within six months), and the presence of clinically significant infections (such as *Clostridioides difficile* infection). Additionally, the study excluded hospitalised patients or those who had received medical contraindications to engage in any form of PA (e.g., due to decompensated rheumatologic or cardiac conditions).

All variables collected in the questionnaire were then divided based on the age cut-off of 50 years to examine the differences between the two resulting groups (i.e., patients under 50 and those 50 years and older).

2.2. Description of Data Collection for the Study Variables, Including PA Levels

The questionnaire allowed the collection of various demographic variables (such as sex, level of education, type of occupation, and presence of a partner), anthropometric variables (such as weight, height, and body mass index), habitual variables (such as smoking status or alcohol consumption), and clinical variables (type of IBD, previous and ongoing therapies received, significant comorbidities).

The questionnaire also included a section on disease activity. However, instead of using the PMS and HBI (which, as specified, were only used as a filter for patient inclusion in the study), which require an integrated physician assessment, disease activity was measured using a more appropriate tool (i.e., patient-reported) that relied solely on the patient's judgement. Moreover, PROs are more reliable than physician-reported outcomes in assessing the social burden of IBD, including aspects such as PA [13]. To this aim, disease activity was assessed exclusively using patient-reported variables, encompassed in the patient-reported outcome (PRO) 2 tool for both CD [14] and UC [15] patients. Thus, for UC patients, subscores on bowel frequency and rectal bleeding were collected, while for CD patients, in addition to bowel frequency, data on abdominal pain were also collected. The interpretation of the total score to determine disease activity or remission status was carried out following the available scoring system [14,15].

The levels of PA were assessed using the Italian-validated [16] version of the International PA Questionnaire (IPAQ), which evaluated the type and amount of PA practised by patients in the last week [17]. In terms of type, this questionnaire can distinguish between intense activities (such as typically aerobic activities like running), moderate-level activities such as light weightlifting, and finally, mild-grade activities/walking, such as regular walking for less than 15 min. IPAQ was scored per the provided International guidelines (https://sites.google.com/view/ipaq/home, accessed on 27 October 2024) In detail, the quantity of PA is expressed as a continuous variable, namely as multiples of the resting metabolic rate (Met) in minutes per week (min/week). However, each activity intensity corresponds to a different multiplier, with a value of 8 for intense activities, 4 for moderate ones, and for light activities, the factor varies. This latter factor depends on the intensity of physical effort (perceived as a change in respiratory frequency), which is qualitatively indicated as a steep grade and can range from 2.5 to 3.3.

Patients were classified as inactive (<700 Met min/week), sufficiently active (700–2500 Met min/week), or active/HEPA (>2500 Met min/week) based on the total score computed from the sum of different types of PA intensities [18,19].

As a completion to the questionnaire administered to patients, a final section comprised a series of questions exploring the barriers, beliefs, and facilitators related to PA encountered by patients using a 5-point Likert scale of agreement (ranging from completely agree to disagree). In the context of these questions, which specific IBD symptoms could be more or less hindering regular PA for the patients was investigated.

This section also included a final question aiming to assess, on a 10-point Likert scale, the degree of importance patients placed on discussing PA with their gastroenterologist during medical check-up visits.

2.3. Statistical Analysis

Descriptive statistics were employed for data presentation. Continuous variables were showcased as a median and relative interquartile range, while categorical and ordinal variables were represented as a percentage of the total (%). The distribution of variables was preliminarily assessed using the Kolmogorov–Smirnov test to determine whether parametric or nonparametric analyses were appropriate based on study outcomes. The relationship between categorical variables was examined using the χ^2 and Fisher's exact tests, as appropriate. The Mann–Whitney U test was utilised to compare ordinal continuous variables with two-level categorical independent variables. Kruskal–Wallis's test was employed for ordinal variables with multiple degrees of freedom. The strength of correla-

tions between variables of interest was assessed using Spearman's test, also presenting the correlation coefficient (ρ).

PA levels were dichotomized (active/inactive), and a threshold of 699 Met week/min (according to IPAQ scoring) was selected, defining active as those with PA > this threshold.

To assess predictors of physical inactivity, the independent variables in the logistic regression model included other relevant continuous and categorical variables. The goodness of fit of the regression model was evaluated using Hosmer–Lemeshow, Cox and Snell R^2, and Nagelkerke R^2 values, expressing the data as an exponential value of B [exp (B)]. Exp(B) was presented as an odds ratio and a 95% confidence interval (95% CI).

To evaluate the internal reliability of the survey questions regarding patient barriers/facilitators to PA, Cronbach's alpha coefficient was analysed, yielding a value of 0.7. A statistical significance level of $p < 0.05$ (two-tailed) was accepted, with an alpha error of 0.05. Statistical analyses were performed using IBM® SPSS® software (version 25, IBM Corp.©, Armonk, NY, USA), graphs were generated using GraphPad PRISM® (version 9.5.0, GraphPad Software LLC©, Boston, MA, USA), and sample size calculations were conducted using G*Power software (version 3.1.9.6, Faul, Erdfelder, Lang, & Buchner, Dusseldorf, Germany).

3. Results

3.1. Baseline Characteristics and PA Levels Across Age Groups

The 237 enrolled IBD patients had a median age of 43 (30–56) years, with 149 (62.9%) below the age of 50 and the remaining 88 (37.1%) aged at least 50 years.

The clinical–demographic characteristics of the sample are presented in Table 1. When divided into the two identified age groups, the sample showed no significant heterogeneity except for the expected age difference [33 (26–42) vs. 57 (54–61.75) years, $p < 0.0001$].

Table 1. Comparison of the primary clinical and demographic variables between the two groups of interest relative to sample stratification based on age, using a cut-off of 50 years.

Variable	Younger Patients (<50 Years, *n* = 149)	Middle-Aged and Older Adults (≥50 Years, *n* = 88)	*p* [1]
Age (y)	33 (26–42)	57 (54–61.75)	**<0.0001**
Gender			
Male	73 (48.99%)	54 (61.4%)	0.08 [2]
Female	76 (51%)	34 (38.6%)	
IBD type			
Crohn's disease	62 (41.6%)	39 (44.3%)	0.786 [2]
Ulcerative colitis	87 (58.4%)	49 (55.7%)	
BMI (Kg/m^2)	23.84 (21.21–26.45)	24.23 (21.48–26.6)	0.316
Education level			
Primary	43 (28.9%)	20 (22.7%)	0.523
Secondary	86 (57.7%)	53 (60.2%)	
Degree	20 (13.4%)	15 (17%)	
Job status			
Unemployed	69 (46.3%)	41 (46.6%)	0.641
Employee	35 (23.5%)	24 (27.3%)	
Entrepreneur	19 (12.8%)	12 (13.6%)	
Worker	9 (6%)	5 (5.7%)	
Student	17 (11.4%)	6 (6.8%)	
Smoking status			
Active	23 (15.4%)	19 (21.6%)	0.201
Past smoker	30 (20.1%)	19 (21.6%)	
Never	96 (64.4%)	50 (56.8%)	

Table 1. *Cont.*

Variable	Younger Patients (<50 Years, *n* = 149)	Middle-Aged and Older Adults (≥50 Years, *n* = 88)	*p* [1]
Alcohol consumer [3] (yes)	11 (7.4%)	12 (13.6%)	0.172 [2]
Biologics/small molecules (yes)	104 (69.8%)	61 (69.3%)	0.999 [2]
Previous biologics failure (yes)	31 (20.8%)	27 (30.7%)	0.117 [2]
Steroids active use (yes)	12 (8.1%)	2 (2.3%)	0.088 [2]
Steroids dose (mg)	7.5 (5–18.5)	12.5 (10)	0.072
Major comorbidity			
Arthritis [4]	40 (26.8%)	34 (38.6%)	
Hypertension	17 (11.4%)	23 (26.1%)	
Dyslipidaemia	28 (18.8%)	30 (34.1%)	0.998
Diabetes	7 (4.7%)	12 (13.6%)	
Nephropathy	7 (4.7%)	6 (6.8%)	
Pneumopathy	4 (2.7%)	4 (4.5%)	
Thyroid disease	17 (11.4%)	6 (6.8%)	
Previous surgery	67 (45%)	31 (35.2%)	0.172 [2]
Stable partner (yes)	103 (69.1%)	67 (76.1)	0.297 [2]

IBD: inflammatory bowel disease; BMI: body mass index. [1] The *p*-value is calculated to weigh the differences between the two groups. Significant *p*-values ($p < 0.05$) are highlighted in bold. [2] The *p*-value is calculated to weigh the differences between the two groups (using statistics based on the χ^2 and Fisher's exact test where appropriate). Significant *p*-values ($p < 0.05$) are highlighted in bold. [3] Definition as an alcohol user in cases of daily alcohol consumption equalling or exceeding 20 g (for females) or 30 g (for males). [4] This specific comorbidity was identified after scrutiny as an extra-intestinal manifestation associated with the underlying IBD.

Concerning the primary outcome, stratifying IBD patients based on PA measured by IPAQ has shown a significant intra-sample difference when considering a cut-off of 50 years. In the patient group under 50 years of age, the majority were classified as sufficiently active (82, 55%), with a minority classified as HEPA active (8, 5.4%) and the remaining as inactive (59, 39.6%). Conversely, in the patient group aged 50 and over, this ratio wholly reversed, with 52 (59.1%) patients classified as inactive, only 35 (39.8%) as sufficiently active, and 1 (1.1%) as HEPA active ($p = 0.0002$).

The overall levels of PA total score were found to be 892 (446.5–1439) and 545.25 (257–1210.47) Met min/week in patients under and over 50 years of age, respectively ($p = 0.007$). As depicted in Figure 1A–D, the primary determinants of the IPAQ total score differences (in which the PA rates are calculated) were activities involving higher levels of physical exertion.

Intense PA [0 (0–224) vs. 0 (0–160) Met min/week, $p = 0.021$] and moderate PA [208 (0–516) vs. 26 (0–417) Met min/week, $p = 0.038$] were found to be higher in patients under 50 compared to those over 50 years old. Conversely, mild/walking activities did not differ between these two groups [360 (151.5–862.5) vs. 291.25 (156.37–538.12) Met min/week, $p = 0.182$]. A weak negative correlation was also found between age and PA total score for vigorous activities ($\rho = -0.127$, $p = 0.049$).

Finally, being over 50 years of age emerged as a predictor of physical inactivity (defined as an IPAQ total score < 700 Met min/week) in logistic regression analysis ($\beta = 1.194$, OR: 3.302, 95% CI 1.224–8.905, $p = 0.018$).

The stratification of PA levels (in terms of IPAQ total score) based on the presence or absence of arthritis did not show any significant differences in patients aged at least 50 years ($p = 0.208$) or in younger patients ($p = 0.328$), excluding a relevant impact of this comorbidity (also considering the exclusion from the study of patients with significant rheumatologic impairment).

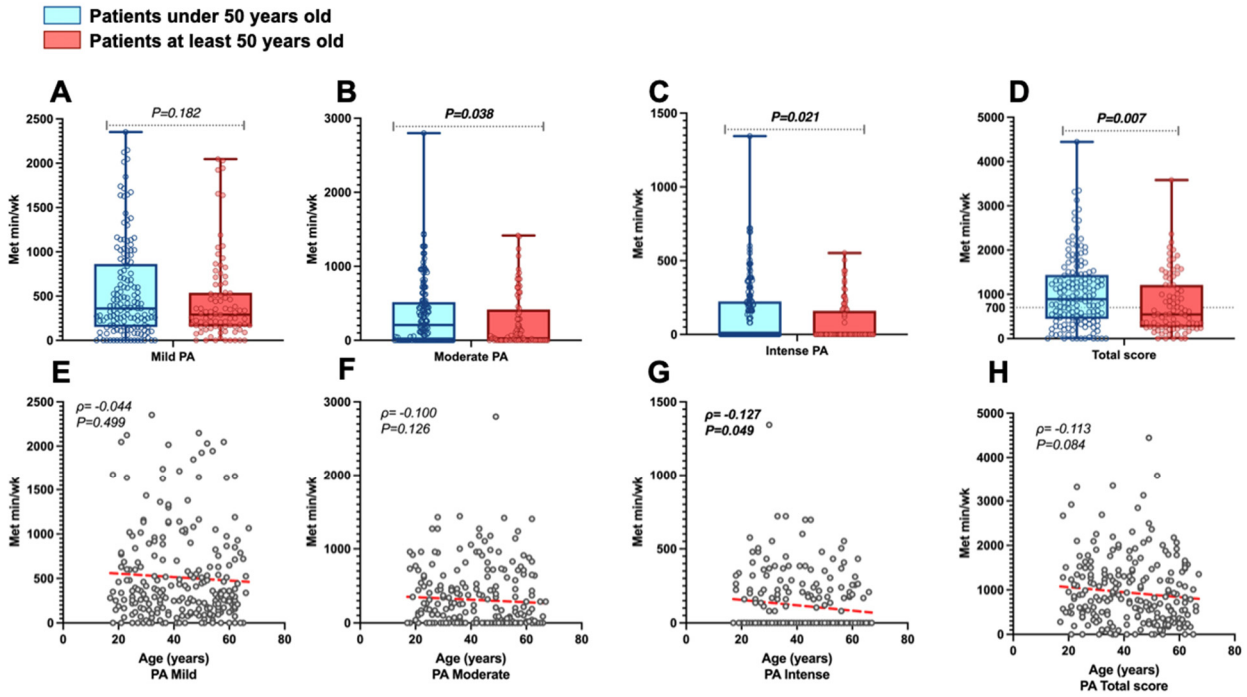

Figure 1. Interleaved box and whisker plots depict physical activity (PA) levels, stratified by two age groups (< or ≥50 years) across panels (**A**–**D**). PA levels are expressed in resting metabolic rate (Met) in min/wk. Panels (**A**–**C**) show the mild, moderate, and intense activities individually, while panel (**D**) presents the summation of all activities to provide the total score. Correlation analysis regarding PA intensity and age is presented in panels (**E**–**H**). In graphs (**E**–**H**), the total PA score is indicated on the y-axis. In graph (**D**), the threshold for physical inactivity (i.e., 700 Met min/week) is also depicted as a grey dashed horizontal line. Spearman's correlation coefficient (ρ) is also displayed in graphs (**E**–**H**). *p*-values are also provided for comparisons between the groups of interest. Significant *p*-values (i.e., <0.05 two-tailed) are also included in bold.

3.2. The Patient-Reported Disease Activity Through the PRO-2 Tool Does Not Appear to Differentiate the Levels of PA Based on Belonging or Not Belonging to Middle Age and Beyond

When stratified by disease activity according to the PRO-2, 81 (54.36%) and 44 (50%) patients had active IBD in the group under and at least 50 years old, respectively, without a clear difference ($p = 0.590$).

Nevertheless, the rate of patients with physical inactivity was found to be 56 (50.4%) and 55 (49.5%) in the group of patients with active and remission IBD (according to PRO-2), respectively ($p = 0.518$). Stratification of the data by age did not show differences in these rates ($p > 0.05$).

Consequently, the IPAQ total score also appeared homogeneous in patients under ($p = 0.802$) and over 50 years old ($p = 0.742$) concerning the PRO-2. Additionally, in both CD and UC patients, at equivalent disease activity levels, patients younger or older than 50 years mainly demonstrated comparable levels of PA, excluding in this setting that disease activity may have significant influences on PA levels (Figure 2A–H, $p > 0.05$).

Finally, the PRO-2 also did not demonstrate a predictor of PA or inactivity. When logistic regression analysis was weighted for patients under (β = 0.014; OR: 1.014, 95% CI 0.386–2.665, $p = 0.978$) and at least 50 years old (β = −1.736; OR: 0.176, 95% CI 0.029–1.077, $p = 0.06$), no marked differences emerged.

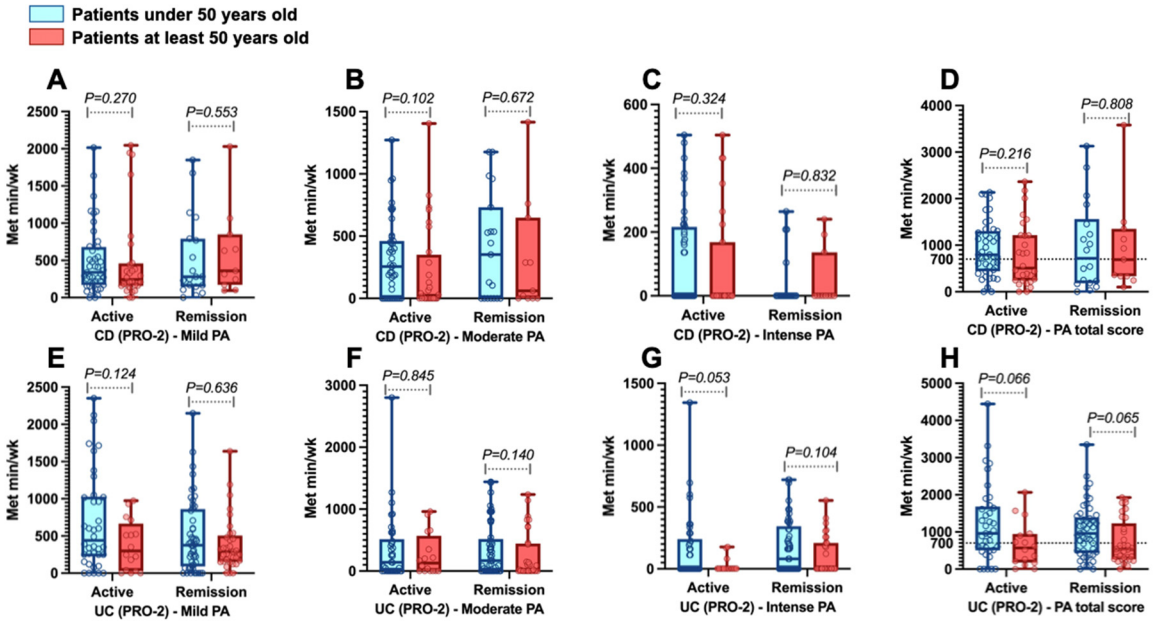

Figure 2. Interleaved box and whisker plots of physical activity (PA) levels, stratified by disease activity severity assessed with the patient-reported outcome (PRO) 2 and type of inflammatory bowel disease in patients with Crohn's disease (CD) in panels (**A**–**D**) and patients with ulcerative colitis (UC) in panels (**E**–**H**) are shown. PA was matched based on intensity into mild/walking type PA (**A**,**E**), moderate (**B**,**F**), intense (**C**,**G**), and also as a total score by summing the previous types of PA (**D**,**H**). In graphs (**D**,**H**), the threshold for physical inactivity (i.e., 700 Met min/week) is also depicted as a grey dashed horizontal line.

3.3. Factors Hindering PA and Willingness to Discuss PA with Their IBD Specialist in Both Groups

The 5-Likert scale questionnaire administered to IBD patients revealed a clear distinction between patients under 50 and those aged 50 and over regarding a specific barrier. Specifically, younger patients exhibited a lower belief (i.e., they were either entirely or partially in disagreement) that IBD constituted a significant impediment to engaging in regular PA compared to patients aged at least 50 (41% vs. 26.1%, $p = 0.04$). Conversely, the remaining barriers or facilitators examined did not show a differential distribution based on age (Table 2).

In addition to this framework, the distribution of barriers related explicitly to IBD symptoms also showed differences based on age group. In patients aged at least 50, typical symptoms of rectal syndrome, particularly bleeding (4.5% vs. 2%) and bowel urgency (48.9% vs. 36.9%), were more pronounced compared to younger counterparts (Figure 3A–E, $p = 0.022$). This analysis, stratified by type of IBD, confirmed these findings in patients with UC (Figure 3F–J, $p = 0.014$) and even more prominently in those with CD (Figure 3K–O, $p = 0.014$), highlighting a greater significance of abdominal pain in younger patients in both cases. Not by chance, patients with bowel urgency exhibited generally poorer levels of intense PA ($p = 0.01$), moderate PA ($p = 0.029$), and PA total score ($p = 0.014$), as highlighted in Figure 3P–R.

Table 2. Distribution of responses to the 5-Likert scale questionnaire regarding facilitators and barriers influencing a higher or lower tendency of inflammatory bowel disease (IBD) patients to engage in regular physical activity (PA), categorised by age group.

Question Domain	Younger Patients (<50 Years, *n* = 149)					Middle-Aged and Older Adults (≥50 Years, *n* = 88)					*p*-Value [1]
	CA	PA	IR	PD	CD	CA	PA	IR	PD	CD	
IBD as a block to PA	5 (3.4%)	39 (26.2%)	44 (29.5%)	22 (14.8%)	39 (26.2%)	17 (19.3%)	27 (30.7%)	21 (23.9%)	6 (6.8%)	17 (19.3%)	**0.04**
IBD treatment as a block to PA	2 (1.3%)	12 (8.1%)	49 (32.9%)	12 (8.1%)	74 (49.7%)	6 (6.8%)	5 (5.7%)	37 (42%)	4 (4.5%)	36 (40.9%)	0.670
PA as a trigger of IBD activity	37 (24.8%)	12 (8.1%)	28 (18.8%)	15 (10.1%)	57 (38.3%)	31 (35.2%)	16 (18.2%)	15 (17%)	4 (4.5%)	22 (25%)	0.532
PA as an inducer of IBD complications	9 (6%)	15 (10.1%)	27 (18.1%)	21 (14.1%)	77 (51.7%)	9 (10.2%)	11 (12.5%)	21 (23.9%)	9 (10.2%)	38 (43.2%)	0.918
PA can improve IBD	21 (14.1%)	60 (40.3%)	35 (23.5%)	5 (2.4%)	28 (18.8%)	7 (8%)	29 (33%)	32 (36.4%)	3 (3.4%)	17 (19.3%)	0.977
PA can prevent IBD relapse	19 (12.8%)	66 (44.3%)	42 (28.2%)	13 (8.7%)	9 (6%)	6 (6.8%)	23 (26.1%)	46 (52.3%)	7 (8%)	6 (6.8%)	0.126
My GP informed me about PA/IBD	41 (27.5%)	41 (27.5%)	25 (16.8%)	7 (4.7%)	35 (23.5%)	11 (12.5%)	15 (17%)	21 (23.9%)	12 (13.6%)	29 (33%)	0.110
My IBDologist informed me about PA/IBD	59 (39.6%)	52 (34.9%)	16 (10.7%)	7 (4.7%)	15 (10.1%)	24 (27.3%)	29 (33%)	16 (18.2%)	5 (5.7%)	14 (15.9%)	0.318
My social network stimulated me to do PA	68 (45.6%)	48 (32.2%)	13 (8.7%)	9 (6%)	11 (7.4%)	24 (27.3%)	21 (23.9%)	13 (14.8%)	21 (23.9%)	21 (23.9%)	0.181
My social network dissuade me from doing PA	0 (0%)	22 (14.8%)	22 (14.8%)	17 (11.4%)	88 (59.1%)	0 (0%)	15 (17%)	15 (17%)	10 (11.4%)	48 (54.5%)	0.568
Before my IBD diagnosis, I had a greater tendency to engage in regular PA	25 (16.8%)	32 (21.5%)	31 (20.8%)	8 (5.4%)	53 (35.6%)	18 (20.5%)	13 (14.8%)	26 (29.5%)	5 (5.7%)	26 (29.5%)	0.669

CA: Completely agree; PA: Partially agree; IR: I think it is irrelevant; PD: Partially disagree; CD: Completely disagree; GP: general practitioner. [1] The *p*-value (Kruskal–Wallis test) is calculated to weigh the differences between the two groups (i.e., <50 and ≥50 years). Significant *p*-values ($p < 0.05$) are highlighted in bold.

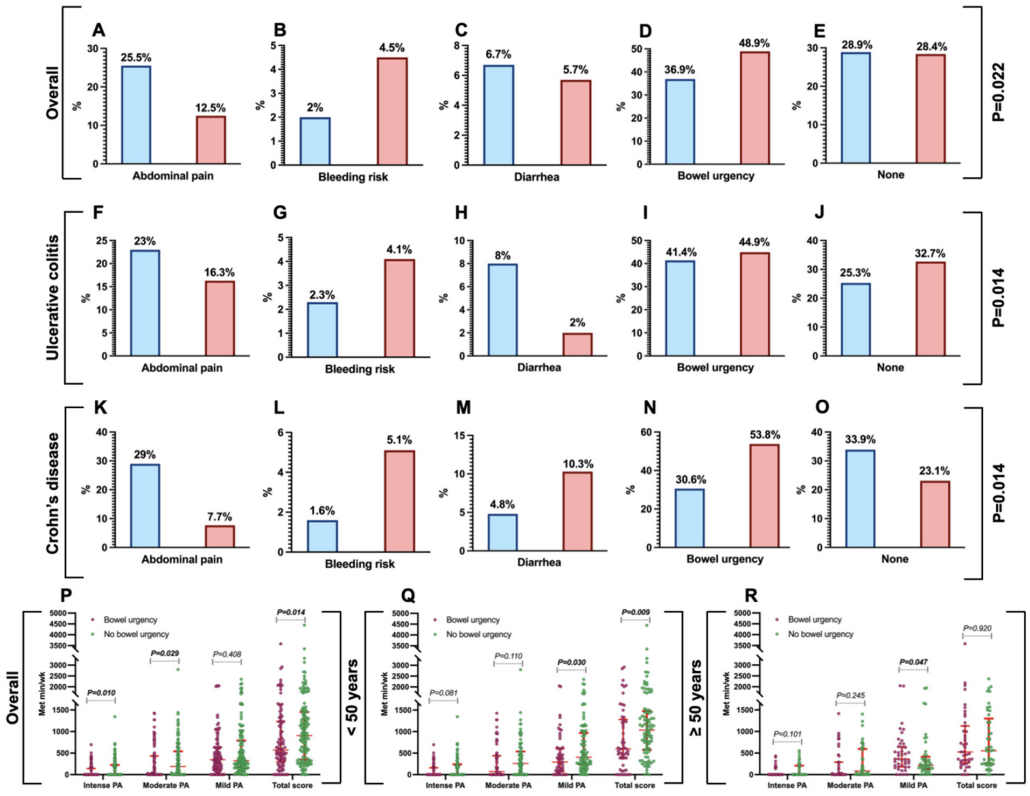

Figure 3. Barriers to engaging in regular physical activity reported by patients, stratified by age group in patients under 50 years old (blue) and patients aged at least 50 (red). The data are presented both

for the overall sample (**A**–**E**) and specifically for the type of inflammatory bowel disease, ulcerative colitis (**F**–**J**), and Crohn's disease (**K**–**O**), respectively. Percentages are relative to the total of each specific subgroup. Additionally, interleaved scatter plots are included to illustrate differences in physical activity based on the presence or absence of bowel urgency, both in the overall sample (**P**) and in patients under (**Q**) or at least (**R**) 50 years of age. Physical activity levels are expressed in resting metabolic rate (Met) in min/wk. *p*-values are also provided for comparisons between the groups of interest. Significant *p*-values (i.e., <0.05 two-tailed) are also included in bold.

Furthermore, despite these differences, the importance attributed by patients to wanting to discuss PA with their gastroenterologist, as expressed on a 10-point Likert scale, did not vary based on age group [6 (4–8) vs. 5 (3–8), $p = 0.119$] in patients under 50 years old and those aged at least 50, respectively.

4. Discussion

This study highlights how the age of 50 can be a potential threshold that reduces the tendency of patients with IBD to engage in regular PA, with this cut-off also demonstrating predictive power (OR: 3.302). This is supported by the dramatically different rates of inactivity (59.1% vs. 39.6%, $p = 0.0002$) observed in favour of the group aged at least 50 years compared to their younger counterparts. To exacerbate the situation, the median levels of PA in older patients were alarmingly below the threshold of minimal PA (i.e., 700 Met min/week), amounting to 545.25 (257–1210.47) Met min/week, with levels only slightly higher than this threshold in younger patients, at 892 (446.5–1439) Met min/week.

Indeed, these data will need to be compared in future studies with a healthy counterpart to verify the differences in the magnitude of age's impact on PA levels in the IBD setting compared to the general population.

These findings are concerning in light of the evident benefits that PA can offer patients with IBD, including fatigue reduction and improvement in quality of life [20].

Finding comparisons regarding PA in IBD is not straightforward, especially considering that many studies have been conducted as surveys and not all studies have assessed PA levels using standardised tools (such as IPAQ). A previous survey, although not explicitly analysing to identify a specific age threshold, reported a dramatically reduced PA trend in patients at least 60 years compared to the 30–59 age group [21]. In addition, another survey also identified a significant negative relationship between age and PA ($r = -0.158$) only in patients with UC [22], whereas in our case, this unfavourable impact of age was observed in patients with CD as well.

Our study did not observe a clear difference in the PRO-2 based on PA levels, suggesting that disease activity (despite excluding patients with severe disease) does not appear to influence these levels dramatically. However, as demonstrated by other studies, higher PA levels may indeed be associated with a lower relapse rate in patients with IBD [23].

On the other hand, however, delving into the clinical aspects of IBD, specific clinical manifestations seem to carry more weight than others in discouraging patients from engaging in regular PA, especially bowel urgency (48.9% in our study, Figure 3). In a previous survey by Tew et al. [22], a large sample of over 800 patients with IBD (mostly female) also reported bowel urgency as a transparent barrier to PA in 61% of cases. It is well known that urgency is a significant form of stigma [24] experienced by patients with IBD and, therefore, is a predictable barrier to PA. Patients may fear attending facilities where they can exercise, especially in groups, where physical exertion could be seen as a trigger for sudden urgent evacuation and the urgent need to find a bathroom or fear of episodes of faecal incontinence. This issue appears to impact older patients more significantly than younger ones in our setting (Figure 3D,I,N). In younger individuals, however, abdominal pain appears to be a more prevalent barrier (Figure 3A,F,K). Consequently, it is central, especially in older patients, to improve or, when possible, resolve bowel urgency to allow patients to have greater confidence in engaging in exercise [25].

In addition, the 5-Likert scale questionnaire focusing on the main domains (see Table 2), which was filtered based on age groups identified in our study, clearly indicated that patients aged over 50 more strongly perceive the misconception that IBD itself is the real barrier to engaging in regular PA ($p = 0.04$). This finding necessitates serious consideration of the need to hypothesise cognitive–behavioural strategies [26] aimed at correcting the hypervigilance of patients that generates insecurities and fear towards engaging in activities that contribute to normal well-being and fitness, as seen in the general healthy population. Thus, the potential disability associated with IBD should not be a priori impediment to engaging in any form of PA. Indeed, cognitive–behavioural techniques have already shown promising results in improving IBD patients' quality of life [26] and correcting erroneous practises, such as poor adherence to conventional oral therapy [27].

This unfavourable condition of reduced PA in IBD patients over 50 years of age could be attributed to several IBD-related factors in addition to purely age-related aspects. While fatigue is a common complaint among IBD patients across all age groups [28], it tends to affect a significant portion of older patients [29]. Moreover, anxiety and depressive disorders are highly prevalent in elderly patients with IBD [30], often persisting even in periods of complete disease remission [31], and are strong predictors of fatigue [32,33]. In this vicious cycle, which only serves to reduce PA further, the latter can paradoxically be a potential solution or improvement factor for both fatigue and anxiety–depressive disorders [34,35]. Another factor that may influence PA is diet, which can exhibit significantly different patterns among IBD patients depending on their age group [36]. Different dietary patterns can lead to distinct gut microbiota phenotypes, both pro-inflammatory and anti-inflammatory [37], in a population already predisposed to likely IBD-induced dysbiosis [38]. Finally, older age can lead to a longer disease duration than younger individuals, even with the same age at diagnosis. This extended period of long-term inflammation could inevitably reduce the tendency to engage in regular PA [39]. All these considerations, however, remain speculative and require a series of future studies to explore in depth the complex and largely uncharted relationships between PA, diet, psychology, chronic inflammation, and alterations in the gut microbiota.

This study has several strengths, including a large sample size compared to previous literature and standardised criteria for assessing disease activity (i.e., PRO-2) and PA (i.e., IPAQ). Among the limitations, however, are the monocentric nature of the study and the need to confirm subgroup analyses with smaller sample sizes in larger cohorts. Additionally, the mono-national nature of the study precludes highlighting intra-cultural differences regarding the relationship between age and PA. Additionally, the cross-sectional design allows for predictive considerations based on OR-based regression, yet future studies that weigh prospective risk measures such as relative risk are desirable.

Finally, in future studies, the delicate relationship between PA and dietary regimen can be further explored to examine their different influences, considering the combined beneficial effects they can both bring to health [40]. This also considers patient adherence to health-promoting dietary regimens, such as the Mediterranean diet, which is reported as low in several studies on individuals with IBD [41,42].

5. Conclusions

In conclusion, this study raises the alarm about the need to identify corrective strategies to address the significant decline in regular PA among patients aged at least 50 years, where, as demonstrated in this study, there is a sharp increase in rates of physical inactivity compared to younger populations. Insecurities and barriers persist, and specific symptoms, such as those more distal (primarily bowel urgency), must be appropriately managed. There is a strong patient need (as shown by our 10-point Likert scale of interest) to discuss PA with their gastroenterologist (and this is independent of age group). New studies are needed to identify which interventions are most appropriate in these age groups to improve adherence to regular exercise, and others are needed to strengthen further the concept that PA is not dangerous for patients with IBD to identify preferred intensity levels and

sports for these patients. Synergistic, multidisciplinary efforts from sports medicine and gastroenterology are necessary to produce clear recommendations in line with current major international guidelines.

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