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ORIGINAL ARTICLE

Depression and resilience in ulcerative colitis and Crohn's disease patients with ostomy

Ji H. Hwang[1] | Chang S. Yu[2]

[1]Department of Nursing, ASAN Medical Center, Seoul, Korea

[2]Division of Colon and Rectal Surgery, Department of Surgery, ASAN Medical Center, University of Ulsan College of Medicine, Seoul, Korea

Correspondence
Chang Sik Yu, MD, PhD, Division of Colon and Rectal Surgery, Department of Surgery, ASAN Medical Center, University of Ulsan College of Medicine, 88, Olympic-ro 43-gil, Songpa-gu, Seoul 05505, Korea.
Email: csyu@amc.seoul.kr

The purpose of this study is to identify the degree of depression and resilience in ulcerative colitis (UC) and Crohn's disease (CD) patients with ostomy and describe the correlation between depression and resilience in UC and CD patients with ostomy. 24 UC patients and 66 CD patients with ostomy were recruited from Metropolitan Hospital in Seoul, Korea. The total mean scores of depression and resilience in UC patients were 13.42 and 123.75, respectively, and in CD patients with ostomy they were 14.24 and 119.18, respectively. Depression and resilience in UC patients with ostomy were not correlated with general characteristics. Depression in CD patients with ostomy correlated with marital status ($t = 2.27$, $P = 0.027$), economic status ($F = 3.98$, $P = 0.012$), sleep disorder ($t = 4.73$, $P < 0.001$), and sleep time ($t = 2.11$, $P = 0.039$). Resilience in UC patients with ostomy correlated with religion ($t = 2.47$, $P = 0.016$), marital status ($t = -3.61$, $P = 0.001$), economic status ($F = 4.06$, $P = 0.011$), and sleep disorder ($t = -3.11$, $P = 0.003$). Significant negative correlation was found between depression and resilience in UC ($r = -0.668$, $P < 0.001$) and CD patients with ostomy ($r = -0.604$, $P < 0.001$). We recommend counselling to wound ostomy continence nurses (WOCNs) about their goal setting, facilitating adaptation of disease and ostomy in clinical setting. And we expect that WOCNs adopt a formalised and tailored long-term approach or program to follow up for UC and CD patients with ostomy.

KEYWORDS

Crohn's disease, depression, ostomy, resilience, ulcerative colitis

1 | INTRODUCTION

Despite the recent advances in medical treatments for ulcerative colitis (UC) and Crohn's disease (CD), UC and CD patients continue to require high surgical interventions.[1–4] The incidence and prevalence of UC and CD in Korea are still lower than those in Western countries, but have been rapidly increasing during the past few decades. The result of the recent Korea nationwide population-based study has shown that the mean annual incidence for UC was 4.6 per 10^5 and for CD was 3.2 per 10^5 inhabitants, respectively, in 2006-2012.[5]

Progression of anatomic damage in UC and CD leads to development of complications that are inaccessible to medical therapy and require surgery.[6] Patients with UC undergo restorative proctocolectomy and temporary ostomy. However, patients with CD experience disease recurrence and require repetitive surgery and are more at risk for permanent ostomy than UC.[6,7] Permanent stoma might be required for CD patients with disabling chronic active perianal disease and extensive colon involvement.[6,8] The poor progression and surgical situations such as bowel resection and ostomy creation can be factors that increase psychological stress in patients with UC and CD.[9,10] Despite benefits such as

improved physical well-being, the creation of an ostomy is a life-changing event. The psychosocial impact of ostomy has been studied in a range of disorders, such as cancer, with few studies focusing specifically on UC and CD.[11]

Already in 1986, studies showed interest in the psychological effects of ostomy creation amongst patients with inflammatory bowel disease (IBD), cancer, and diverticulitis.[12] A lot of patients with ostomy experience many problems such as pouch leakage, poor hygiene, body image change, limitation of social activity, and sexual dysfunction.[11] These led to psychiatric problems such as depression, anxiety, and suicidal impulse.[13–15]

Resilience is an individual quality based on psychology, society, relationship, situation, and beliefs about the self, which is demonstrated when faced with a crisis or adversity that threatens life or changes the quality of life of a person.[16] Several studies are performed to investigate the relations between resilience and depression but they have been mostly performed on cancer patients, elderly people, and children.[17–19] Especially, UC and CD patients with ostomy have different particularities associated with onset of disease and period of disease from chronic disease, cancer, and elderly disease. And there is a clear difference from previous studies related to children because they are adults who should have a social activity. Resilience is a necessary factor for UC and CD patients with ostomy considering their circumstances and characteristics of unique disease.

Therefore, the purpose of this study was to (a) identify a variety of general and clinical characteristics of UC and CD patients with ostomy, (b) investigate the degree of depression and resilience in UC and CD patients with ostomy, and (c) investigate the correlation between depression and resilience in UC and CD patients with ostomy.

2 | METHODS

2.1 | Design

This was a descriptive correlation study to evaluate the degree and relationship between depression and resilience of UC and CD patients with ostomy.

2.2 | Settings and subjects

This study was performed between November and December 2012 in a tertiary hospital in Seoul, Korea. Based on the following criteria, adult patients, who were at least 20 years old, understood the purpose of the research, and agreed to participate, were enrolled, excluding those who had a history of using or were under medication for psychiatric reasons. The necessary sample size for correlation analysis was calculated using the G*power program (Heinrich Heine Universität, Düsseldorf, Germany) based on Cohen's sample size estimation table. When calculating G-power, the

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Key Messages

- the degree of depression and resilience in ulcerative colitis (UC) and Crohn's disease (CD) patients with ostomy were evaluated in relation to the disease to identify the relationship between them
- depression was found to be negatively correlated with resilience in the case of both UC and CD patients with ostomy
- understanding the impact of depression and resilience on the general and clinical characteristics of UC and CD patients with ostomy can help in developing high quality and tailored nursing care

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effect size was set to 0.3, the significance level at 0.05, and power at 0.8. The results of the calculation showed that 82 patients were necessary. In this study, data were collected analysing 90 patients and the results were reported.

2.3 | Procedures for data collection

Depression was measured using a scale that is Kim et al.'s[20] Korean revision of Beck Depression inventory-II (BDI-II).[21] This scale retains the 21 items with four options under each item, ranging from not present 0 to severe 3. Higher total scores indicate more severe depressive symptoms. BDI-II was revised BDI based on the diagnostic criteria of depression disorder in DSM-IV[22] and is used to evaluate the symptoms of the past 2 weeks. The score ranges from a minimum of 0 to a maximum of 63 points. The BDI-II score indicates the following.

1. 0-13 points: normal
2. 14-19 points: mild depression
3. 20-28 points: moderate depression
4. 29-63 points: severe depression

Regarding the reliability of the tool, the Cronbach's α value was 0.92 at the time of its development by Beck et al[21]; the Cronbach's α value was 0.80 in the study reported by Kim et al,[20] and it was 0.89 in our study.

We evaluated resilience using Kim's[20] translation version of the resilience scale developed by Wagnild and Young.[21] The score ranges from a minimum of 25 to a maximum of 175 and a higher score indicates more resilience. Regarding the reliability of the tool, the Cronbach's α value was 0.91 at the time of its development. The Cronbach's α value was 0.87 in Kim et al's study,[20] and it was 0.90 in our study.

2.4 | Data collection

Data were collected by direct and mailed survey. We guaranteed anonymity of the patients for participating in the study and to stop participation any time if they believed that the questionnaire violates ethics. About 10 to 15 minutes were

spent on completing the questionnaire. For the direct survey, we explained the purpose of the study and collected data directly through a face-to-face survey from patients who gave consent. For hospitalised patients, the researcher visited the wards. For mailed survey, we asked for permission by phone and then we sent a mail to agreed patients. The post mail contained a return envelope with a return stamp and the instructions for completion of survey. The data were collected by 61 direct survey and 29 mailed survey (the response rate was 69%).

2.5 | Ethical considerations

This study was performed after receiving approval from the Institute Review Board (IRB) of ASAN Medical Center (IRB Approval Number 2012-0781) to ethically protect patients who participated in it. Written and verbal explanations about the purpose and methods of research, guarantee of anonymity regarding research participation, voluntary agreement or refusal to participate, choice to terminate, and the possible benefits and risks of participation were given during the recruitment of research participants, and voluntary consent was obtained to provide maximum protection to research participants ensuring confidentiality. The manuscript must include assurance that the study protocol conformed to the ethical guidelines of the 1975 Declaration of Helsinki as reflected in approval by the institution's human research review committee. A statement to this effect must be provided within Section 2.

2.6 | Statistics

The collected data were all encrypted and analysed using the SPSS 18.0 program (New York, NY, USA). Quantitative variables were presented through descriptive statistics (mean and SD). The χ^2 test was used to analyse the general and clinical characteristics of UC and CD patients with ostomy. The Mann-Whitney U test, Kruskal-Wallis test, independent t test, and ANOVA were used for comparisons of differences and variance in the depression and resilience of UC and CD patients with ostomy. The level of significance of $P < .05F$ was considered in the analyses. The Spearman's and Pearson's correlation analyses were used for relationship between the depression and resilience in UC and CD patients with ostomy.

3 | RESULTS

3.1 | General characteristics of UC versus CD patients with ostomy

Amongst the 90 patients with ostomy, 24 had UC and 66 had CD. The average age of UC patients was 53.0 years (±13.9), while that of CD patients was 34.3 years (±8.0). Amongst the UC patients, 21 (87.5%) were married, 41 (62.1%) of the CD patients were unmarried. The χ^2 test of general characteristics between the two groups showed significant differences in age, marital status, and exercise level (Table 1).

TABLE 1 General characteristics of UC versus CD patients with ostomy (N = 90)

Characteristics	Categories	UC (n = 24) n (%)	UC (n = 24) Mean ± SD	CD (n = 66) n (%)	CD (n = 66) Mean ± SD	χ^2	P
Gender	Male	18 (75.0)		35 (53.0)		3.51	0.061
	Female	6 (25.0)		31 (47.0)			
Age (y)	20-29	1 (4.2)	53.0 ± 13.9	24 (36.4)	34.3 ± 8.0	42.60	<0.001***
	30-39	5 (20.8)		24 (36.4)			
	40-49	4 (16.7)		17 (25.8)			
	50 or older	14 (58.3)		1 (1.5)			
Marital status	Married	21 (87.5)		25 (37.9)		17.34	<0.001***
	Unmarried	3 (12.5)		41 (62.1)			
Employed	Yes	17 (70.8)		33 (50.0)		3.09	0.079
	No	7 (29.2)		33 (50.0)			
Monthly household income (1000 USD)	0	2 (8.3)		11 (16.7)		2.52	0.640
	Less than 1	3 (12.5)		4 (6.1)			
	Less 2	4 (16.7)		14 (21.2)			
	2 or more	15 (62.5)		37 (56.0)			
Length of sleep (per day)	Fewer than 6 h	6 (25.0)	6.9 ± 1.5	8 (12.1)	6.7 ± 1.6	2.22	0.136
	6 h or more	18 (75.0)		58 (87.9)			
Exercise (more than 30 min per week)	0 times	4 (16.7)		32 (48.5)		7.43	0.024*
	1-2 times	8 (33.3)		14 (21.2)			
	More than 3-4 times	12 (50.0)		20 (30.3)			

Abbreviations: CD, Crohn's disease; UC, ulcerative colitis. *P<.05, ***P<.001

TABLE 2 Clinical characteristics of UC versus CD patients with ostomy (N = 90)

Characteristics	Categories	UC (n = 24)		CD (n = 66)		χ^2	P
		n (%)	Mean ± SD	n (%)	Mean ± SD		
Time since diagnosis (y)	Under 5	6 (25.0)	10.1 ± 7.5	8 (12.1)	10.8 ± 5.8	3.37	0.186
	5-9	6 (25.0)		28 (42.4)			
	Over 10	12 (50.0)		30 (45.5)			
Number of surgeries relating to disease	1-2 times	18 (75.0)		30 (45.5)		6.22	0.045*
	3-4 times	4 (16.7)		26 (37.4)			
	5 times or more	2 (8.3)		10 (15.2)			
Time since ostomy surgery (y)	Under 5	20 (83.3)		48 (72.7)		1.90	0.387
	5-9	4 (16.7)		14 (21.2)			
	Over 10	0 (0.0)		4 (6.1)			
Other disease	Existent	13 (54.2)		11 (16.7)		12.66	<0.001***
	Non-existent	11 (45.8)		55 (83.3)			
Weight	Underweight	9 (37.5)	20.3 ± 4.9	38 (57.6)	18.4 ± 3.1	7.52	0.023*
	Normal weight	8 (33.3)		23 (34.8)			
	Overweight or more	7 (29.2)		5 (7.6)			

Abbreviations: CD, Crohn's disease; UC, ulcerative colitis.
Obese/underweight: under 18.5, normal weight:18.5-22.9, overweight: 23.0 or more (unit: kg/m^2). *P<.05, ***P<.001

3.2 | Clinical characteristics of UC versus CD patients with ostomy

The time interval (in years) since the diagnosis of IBD was mostly "more than 10 years" for both groups. Amongst the UC patients, 13 (54.2%) had other diseases, 55 (83.3%) of CD patients did not have any other disease. The χ^2 test of characteristics between the two groups showed that there were significant differences depending on the prevalence of other diseases and the number of surgeries relating to Disease (Table 2).

3.3 | Degree of depression in UC versus CD patients with ostomy

The median degree of depression in UC patients with ostomy was 13.42 (±8.02) and that in CD patients with ostomy was 14.24 (±8.88). Amongst the depression items in UC and CD patients with ostomy, the highest was "changes in appetite." However, the lowest items were different. The lowest item in UC was "suicidal thoughts or idea" and that in CD was "pessimism." And regarding the degree of depression, mild depression was showed in 8 patients (33.3%) of UC and 17 patients (25.8%) of CD; moderate depression was showed in 12 patients (18.2%) of CD. The distribution of scores was wider and more varied amongst the CD patients with ostomy than the UC (Tables 3 and 4).

3.4 | Degree of resilience in UC versus CD patients with ostomy

The median degree of resilience in UC patients with ostomy was 123.75 (±22.43) and that in CD patients was 119.18 (±18.70). The highest item in UC was "I am proud of myself when I achieve something in my life." And the highest item

TABLE 3 Degree of depression in UC versus CD patients with ostomy (N = 90)

Item	UC (n = 24) Mean ± SD	CD (n = 66) Mean ± SD
Changes in appetite	2.79 ± 1.62	3.00 ± 1.79
Loss of libido	2.13 ± 0.99	1.91 ± 0.94
Loss of energy	1.96 ± 0.75	2.14 ± 0.88
Fatigue and tiredness	1.92 ± 0.58	2.11 ± 0.83
Pessimism	1.83 ± 0.96	1.59 ± 0.61
Difficulty in concentrating	1.67 ± 0.70	1.82 ± 0.70
Crying	1.42 ± 0.88	1.70 ± 0.98
Self-dislike	1.42 ± 0.72	1.64 ± 0.60
Changes in sleep patterns	1.38 ± 1.91	2.80 ± 1.68
Self-dissatisfaction	1.33 ± 0.57	1.71 ± 0.55
Suicidal thoughts or idea	1.33 ± 0.48	1.61 ± 0.52
Average total scores	13.42 ± 8.02	14.24 ± 8.88

Abbreviations: CD, Crohn's disease; UC, ulcerative colitis.

TABLE 4 Distribution of depression scores of UC versus CD patients with ostomy (N = 90)

Categorisation depending on degree of depression	UC (n = 24) n (%)	CD (n = 66) n (%)
Normal (0-13 points)	11 (45.8)	32 (48.4)
Mild depression (14-19 points)	8 (33.3)	17 (25.8)
Moderate depression (20-28 points)	4 (16.7)	12 (18.2)
Severe depression (29-63 points)	1 (4.2)	5 (7.6)

Abbreviations: CD, Crohn's disease; UC, ulcerative colitis.

in CD was "Having something to be interested in is important to me." In contrast, the lowest item in UC and CD was "Sometimes I don't know what the core of some problem is" (Table 5).

TABLE 5 Degree of resilience in UC versus CD patients with ostomy (N = 90)

Item	UC (n = 24) Mean ± SD	CD (n = 66) Mean ± SD
I am proud of myself when I achieve something in my life	5.83 ± 1.15	5.85 ± 1.18
I can do something if it needs to be performed	5.79 ± 1.14	5.56 ± 1.17
I think my life has meaning	5.46 ± 1.56	5.08 ± 1.39
Having something to be interested in is important to me	5.46 ± 1.32	5.95 ± 1.20
Because I experienced these difficulties in the past, I can overcome difficulties today	5.46 ± 1.22	5.12 ± 1.53
I can control myself	5.33 ± 1.61	5.02 ± 1.50
In a critical situation, I am someone who other people can comfortably rely on	5.08 ± 1.38	4.62 ± 1.57
I am level-headed when I take care of business	5.04 ± 1.68	4.55 ± 1.29
When I plan, I complete it to the end	5.04 ± 1.33	4.71 ± 1.31
I like myself	4.88 ± 1.57	4.68 ± 1.43
I have something I am continuously interested in	4.79 ± 1.72	4.98 ± 1.56
I have things I can laugh aloud about	4.46 ± 1.74	4.80 ± 1.53
Sometimes I don't know what is a core of some problem	3.88 ± 1.70	3.53 ± 1.40
Average score	4.97 ± 1.55	4.77 ± 1.42
Average total score	123.75 ± 22.43	119.18 ± 18.70

Abbreviations: CD, Crohn's disease; UC, ulcerative colitis.

3.5 | General characteristics and depression of UC versus CD patients with ostomy

There were no significant differences in the degree of depression related to general characteristics of UC patients with ostomy. However, marital status ($t = 2.27$, $P = 0.027$), monthly household income ($F = 3.96$, $P = 0.012$), length of sleep ($t = 2.11$, $P = 0.039$), and sleep disorders ($t = 4.73$, $P < 0.001$) had significant effects on the degree of depression in CD patients with ostomy. The Scheffe's test showed that CD whose monthly household income was less than 2000 USD had higher depression scores than those whose monthly household income was more than 2000 USD (Table 6).

3.6 | Clinical characteristics and depression of UC versus CD patients with ostomy

There were no significant differences in the degree of depression related to clinical characteristics of UC and CD patients with ostomy (Table 7).

3.7 | General characteristics and resilience of UC versus CD patients with ostomy

There were no significant differences in the degree of resilience related to general characteristics of UC patients with

TABLE 6 General characteristics and depression in UC versus CD patients with ostomy (N = 90)

Characteristics	Categories	UC (n = 24) n (%)	Mean ± SD	Z or F (p)ᵃ	CD (n = 66) n (%)	Mean ± SD	t or F (p)
Gender	Male	18 (75.0)	14.2 ± 9.0	0.67 (0.504)	35 (53.0)	14.0 ± 9.2	0.23 (0.818)
	Female	6 (25.0)	11.0 ± 5.8		31 (47.0)	14.5 ± 8.9	
Age (y)	20-29	1 (4.2)	21.0 ± 0.0	1.50 (0.681)	24 (36.4)	16.9 ± 8.0	1.88 (0.143)
	30-39	5 (20.8)	13.6 ± 3.9		24 (36.4)	13.5 ± 8.7	
	40-49	4 (16.7)	16.6 ± 13.2		17 (25.8)	12.4 ± 10.0	
	50 or older	14 (58.3)	12.1 ± 7.1		1 (1.5)	0.0 ± 0.0	
Marital status	Married	21 (87.5)	16.6 ± 13.2	0.83 (0.406)	25 (37.9)	16.2 ± 7.9	2.27 (0.027)*
	Unmarried	3 (12.5)	13.1 ± 8.7		41 (62.1)	11.1 ± 10.0	
Employed	Yes	17 (70.8)	12.6 ± 8.9		33 (50.0)	14.2 ± 9.9	0.00 (1.000)
	No	7 (29.2)	15.4 ± 7.2		33 (50.0)	14.2 ± 8.2	
Monthly household income (1000 USD)	0ᶜ	2 (8.3)	18.0 ± 3.0		11 (16.7)	17.6 ± 7.9	3.96 (0.012)*
	Less than 1ᵈ	3 (12.5)	17.0 ± 6.5		4 (6.1)	10.8 ± 10.3	e > fᵇ
	Less 2ᵉ	4 (16.7)	13.3 ± 6.3		14 (21.2)	19.6 ± 10.6	
	2 or moreᶠ	15 (62.5)	12.1 ± 8.9		37 (56.0)	11.6 ± 7.5	
Length of sleep (per day)	Fewer than 6 h	6 (25.0)	10.3 ± 7.7	1.04 (0.301)	8 (12.1)	20.4 ± 9.5	2.11 (0.39)*
	6 h or more	18 (75.0)	14.4 ± 8.5		58 (87.9)	13.4 ± 8.7	
Sleep disorder	Existent	12 (50.0)	10.9 ± 6.6	1.27 (0.203)	37 (56.1)	18.3 ± 7.9	4.73 (<0.001)***
	Non-existent	12 (50.0)	15.9 ± 9.4		29 (43.9)	9.1 ± 7.7	

Abbreviations: CD, Crohn's disease; UC, ulcerative colitis. *P<.05, ***P<.001
ᵃ Mann-Whitney U, Kruskal-Wallis test.
ᵇ Scheffe's post hoc test.

TABLE 7 Clinical characteristics and depression in UC versus CD patients with ostomy (N = 90)

Characteristics	Categories	UC (n = 24)			CD (n = 66)		
		n (%)	Mean ± SD	Z or F (p)[a]	n (%)	Mean ± SD	t or F (p)
Time since diagnosis (y)	Under 5	6 (25.0)	15.3 ± 7.0	1.11 (0.578)	8 (12.1)	10.3 ± 9.2	1.79 (0.176)
	5-9	6 (25.0)	15.2 ± 10.2		28 (42.4)	16.4 ± 7.9	
	Over 10	12 (50.0)	11.6 ± 8.3		30 (45.5)	13.3 ± 9.7	
Number of surgeries relating to disease	1-2 times	18 (75.0)	14.1 ± 8.6	1.10 (0.578)	30 (45.5)	14.9 ± 9.4	0.15 (0.856)
	3-4 times	4 (16.7)	13.3 ± 9.3		26 (37.4)	13.5 ± 9.4	
	5 times or more	2 (8.3)	8.0 ± 4.2		10 (15.2)	14.1 ± 7.3	
Time since ostomy surgery (y)	Under 5	20 (83.3)	13.8 ± 8.6	0.18 (0.670)	48 (72.7)	13.8 ± 1.3	0.34 (0.708)
	5-9	4 (16.7)	11.8 ± 7.9		14 (21.2)	16.0 ± 10.6	
	Over 10	0 (0.0)	13.4 ± 8.4		4 (6.1)	13.0 ± 5.0	
Other disease	Existent	13 (54.2)	15.9 ± 8.8	1.60 (0.110)	11 (16.7)	12.7 ± 6.1	0.61 (0.545)
	Non-existent	11 (45.8)	10.6 ± 7.1		55 (83.3)	14.6 ± 9.5	
Weight	Underweight	9 (37.5)	12.0 ± 6.3	0.50 (0.778)	38 (57.6)	15.7 ± 9.5	1.82 (0.171)
	Normal weight	8 (33.3)	12.4 ± 7.6		23 (34.8)	11.4 ± 7.5	
	Overweight or more	7 (29.2)	16.4 ± 11.5		5 (7.6)	16.2 ± 10.0	

Abbreviations: CD, Crohn's disease; UC, ulcerative colitis.
[a] Mann-Whitney U, Kruskal-Wallis test.

TABLE 8 General characteristics and resilience in UC versus CD patients with ostomy (N = 90)

Characteristics	Categories	UC (n = 24)			CD (n = 66)		
		n (%)	Mean ± SD	Z or F (p)[a]	n (%)	Mean ± SD	t or F (p)
Gender	Male	18 (75.0)	122.9 ± 23.8	0.13 (0.894)	35 (53.0)	118.7 ± 20.2	0.20 (0.842)
	Female	6 (25.0)	126.3 ± 24.0		31 (47.0)	119.7 ± 17.5	
Age (y)	20-29	1 (4.2)	93.0 ± 0.0	3.36 (0.339)	24 (36.4)	115.4 ± 11.9	2.29 (0.087)
	30-39	5 (20.8)	119.0 ± 18.7		24 (36.4)	115.9 ± 21.6	
	40-49	4 (16.7)	127.0 ± 36.3		17 (25.8)	128.2 ± 20.6	
	50 or older	14 (58.3)	126.7 ± 17.6		1 (1.5)	137.0 ± 0.0	
Religion	Yes	14 (58.3)	122.2 ± 20.6	0.65 (0.519)	33 (50.0)	124.7 ± 16.6	2.47 (0.016)
	No	10 (41.7)	125.9 ± 27.9		33 (50.0)	113.7 ± 19.6	
Marital status	Married	21 (87.5)	125.0 ± 23.0	0.96 (0.337)	25 (37.9)	129.0 ± 20.0	3.61 (0.001)[**]
	Unmarried	3 (12.5)	115.0 ± 29.9		41 (62.1)	113.2 ± 15.4	
Employed	Yes	17 (70.8)	126.4 ± 25.2	1.08 (0.280)	33 (50.0)	123.6 ± 18.3	1.93 (0.058)
	No	7 (29.2)	117.4 ± 18.4		33 (50.0)	114.8 ± 18.6	
Monthly household income (1000 USD)	0	2 (8.3)	100.0 ± 7.0	3.61 (0.307)	11 (16.7)	108.6 ± 15.2	4.06 (0.011)[*]
	Less than 1	3 (12.5)	117.3 ± 6.0		4 (6.1)	121.0 ± 14.5	
	Less 2	4 (16.7)	134.3 ± 12.5		14 (21.2)	110.4 ± 14.5	
	2 or more	15 (62.5)	125.4 ± 25.8		37 (56.0)	125.5 ± 19.4	
Length of sleep (per day)	Fewer than 6 h	6 (25.0)	137.8 ± 18.8	1.64 (0.102)	8 (12.1)	117.9 ± 24.5	0.208 (0.836)
	6 h or more	18 (75.0)	119.1 ± 23.3		58 (87.9)	119.4 ± 18.2	
Sleep disorder	Existent	12 (50.0)	129.4 ± 24.1	0.98 (0.326)	37 (56.1)	113.2 ± 16.8	3.11 (0.001)[**]
	Non-existent	12 (50.0)	118.2 ± 22.2		29 (43.9)	126.8 ± 18.8	

Abbreviations: CD, Crohn's disease; UC, ulcerative colitis.
[a] Mann-Whitney U, Kruskal-Wallis test. *$P<.05$, **$P<.01$

ostomy. However, religion ($t = 2.47$, $P = 0.016$), marital status ($t = 3.61$, $P = 0.001$), monthly household income ($F = 4.06$, $P = 0.011$), and sleep disorders ($t = 3.11$, $P = 0.003$) had a significant effect on the degree of resilience in CD patients with ostomy (Table 8).

3.8 | Clinical characteristics and resilience of UC versus CD patients with ostomy

There were no significant differences in the degree of resilience related to clinical characteristics of UC and CD patients with ostomy (Table 9).

TABLE 9 Clinical characteristics and resilience in UC versus CD patients with ostomy (N = 90)

Characteristics	Categories	UC (n = 24)			CD (n = 66)		
		n (%)	Mean ± SD	Z or F (p)[a]	n (%)	Mean ± SD	t or F (p)
Time since diagnosis (y)	Under 5	6 (25.0)	122.5 ± 25.8	0.72 (0.700)	8 (12.1)	120.8 ± 19.7	0.06 (0.947)
	5-9	6 (25.0)	115.5 ± 27.4		28 (42.4)	118.4 ± 12.8	
	Over 10	12 (50.0)	128.5 ± 20.9		30 (45.5)	119.5 ± 23.4	
Number of surgeries relating to disease	1-2 times	18 (75.0)	124.6 ± 23.8	0.386 (0.825)	30 (45.5)	118.4 ± 17.0	0.97 (0.384)
	3-4 times	4 (16.7)	119.5 ± 28.1		26 (37.4)	122.5 ± 18.8	
	5 times or more	2 (8.3)	125.0 ± 22.7		10 (15.2)	112.9 ± 23.7	
Time since ostomy surgery (y)	Under 5	20 (83.3)	124.9 ± 23.9	0.487 (0.485)	48 (72.7)	118.0 ± 17.0	0.78 (0.465)
	5-9	4 (16.7)	118.3 ± 23.2		14 (21.2)	124.6 ± 22.9	
	Over 10	0 (0.0)	0.0 ± 0.0		4 (6.1)	114.8 ± 27.0	
Other disease	Existent	13 (54.2)	115.4 ± 23.9	1.89 (0.063)	11 (16.7)	120.3 ± 16.7	0.209 (0.835)
	Non-existent	11 (45.8)	133.6 ± 19.4		55 (83.3)	119.0 ± 19.4	
Weight	Underweight	9 (37.5)	129.3 ± 26.1	0.73 (0.693)	38 (57.6)	117.7 ± 19.2	0.341 (0.712)
	Normal weight	8 (33.3)	124.5 ± 16.2		23 (34.8)	121.8 ± 20.0	
	Overweight or more	7 (29.2)	115.7 ± 27.6		5 (7.6)	118.0 ± 9.5	

Abbreviations: CD, Crohn's disease; UC, ulcerative colitis.
[a] Mann-Whitney U, Kruskal-Wallis test.

TABLE 10 Correlation between depression and resilience in UC patients with ostomy (N = 90)

	Depression	Resilience
Depression	1	
Resilience	−0.668 (P < 0.001)	1

Abbreviation: UC, ulcerative colitis.

TABLE 11 Correlation between depression and resilience in CD patients with ostomy (N = 90)

	Depression	Resilience
Depression	1	
Resilience	−0.604 (P < 0.001)	1

Abbreviation: CD, Crohn's disease.

3.9 | Correlation between depression and resilience in UC versus CD patients with ostomy

The Spearman's and Pearson's correlation analyses were used for relationship between the depression and resilience in UC and CD patients with ostomy. This study showed statistically significant negative correlation between depression and resilience in UC patients with ostomy ($r = -0.668$, $P < 0.001$) and CD patients with ostomy ($r = -0.604$, $P < 0.001$) (Tables 10 and 11).

4 | DISCUSSION

Psychological morbidity, such as anxiety and depression, is up to 50% higher in IBD patients as compared with other chronic disease.[23] In this study, the degree of depression in UC and CD patients with ostomy showed to be slightly higher than the normal range. And 5 (20.9%) of UC and 17 (25.8%) of CD patients with ostomy were found to have moderate to severe depression. There was no significant difference in the proportion of depression between UC and CD patients with ostomy. In the study of Goodhand and colleagues, 18% of UC patients and 19% of CD patients had a depression, which are more higher proportion than 1.7% of the normal population.[24] And Knowles et al[25] found that 16% of 83 IBD patients with ostomy had a moderate to severe depression score. This study showed more higher proportion of depression in UC and CD patients with ostomy than previous studies. However, there was no significant difference of depression degree between UC and CD patients with ostomy, which was a similar point compared with previous studies.[10,23–28] According to the results, having an ostomy seems to primarily impact the depression degree in UC and CD patients. However, the study related to UC and CD patients with ostomy is very rare in Korea. Thus, we suggest that future studies need to identify influence factors associated with depression in UC and CD patients with ostomy and compare the depression degree and influence factors between IBD patients with ostomy and other disease patients with ostomy, such as cancer, another benign disease, and trauma.

Both UC and CD patients with ostomy showed high scores on "changes in appetite" and "loss of energy" amongst the items of depression. In the clinical field, we actually experience problems and complaints similar to these items. Problems associated with diet, nutrition imbalance, and low body weight are more common in CD and UC patients. And these problems lead to frequent fatigue and tiredness, which may affect depression of UC and CD patients with ostomy. A Canadian study on the depression degree of IBD patients showed that poor health condition and poor nutrition were also significant influence factors of depresion.[28] However, Abdalla and colleague observed

significant associations between ostomy status and both fatigue amongst patients with clinically active disease but not for those in clinical remission to CD patients.[4] Therefore, we suggest that further studies need to identify association between having an ostomy, fatigue, and depression in UC and CD patients with ostomy.

The depression degree in CD patients with ostomy showed statistically significant differences depending on marital status, monthly household income, length of sleep, and sleep disorder. This supports results from previous studies reporting marital and financial status as depression factors in CD patients.[4,23,29] CD patients were almost younger than UC patients, and therefore, half the number of participants (32 patients, 50%) responded that they have a job and are in a phase of life wherein vigorous economic activity is required. These results are also related to financial status that a comparatively higher number of CD patients with ostomy are unmarried than UC patients with ostomy. In other words, employment is difficult because of the disease and this likely impacts their financial status, especially, CD patients with ostomy. Therefore, we observed that marital status and financial status were associated with depression in CD patients with ostomy.

Amongst the results of depression items, "change in the type of sleep" scored highly for CD patients and length of sleep and sleep disorder showed statistically significant differences in the depression degree. This showed that the length of sleep and sleep disorder are associated with depression in CD patients with ostomy. Fuller-Thomson and Sulman[28] reported that 21.9% of IBD patients who take sleep medications experienced sleep disorder. CD patients with ostomy showed that they frequently wake up during sleep time and have a difficulty maintaining sleep. They have a difficulty falling into deep sleep because they worry about leakage. However, study related to sleep in UC and CD patients with ostomy is not insufficient. Thus, further detailed research is needed to understand their sleep pattern and disorders and identify the association between sleep management in UC and CD patients with ostomy and depression.

In this study, the median degree of resilience in UC patients with ostomy was 123.75 ($\pm$22.43) and that in CD patients was 119.18 ($\pm$18.70). In the study reported by Scardillo et al,[11] the resilience degree in patients with ostomy showed more higher scores (148.39 $\pm$ 17.07) than this study. However, this study included patients with permanent ostomy regardless of disease. We should interpret based on these differences when comparing the resilience degree in two studies. CD patients with ostomy showed lower resilience scores than UC patients. This could be attributed to the difference between the factors affecting the UC and CD patients with ostomy (age, financial status, marital status, etc.), And this result supports previous research that resilience is increased according to age.[12,30] CD patients with

ostomy showed a significant difference in resilience depending on religion, marital status, monthly household income, and sleep disorder. This matches the results from previous studies on resilience, which reported that financial status, duration of disease or time of onset, having a family, marital status, and financial status affect resilience.[16,17,30,31] However, as previously stated, resilience has not been adequately studied in patients with ostomy. Thus, we suggest that further variety of research is needed to determine the resilience in IBD patients and adolescent patients with IBD or ostomy.

One of the aims of this study was to investigate the relationship between depression and resilience in UC and CD patients with ostomy. This study showed a negative correlation between depression and resilience in UC and CD patients with ostomy, in other words a lower depression degree was correlated with a high resilience degree. This result supports the previous results that poor health condition and low energy more easily lead to depression, and a high depression degree leads to a low resilience degree.

This study has several limitations. Thus, the results from this study should be interpreted with some caveat. A small convenience sample from one tertiary hospital is included in this study. And there is limitation of participants associated with characteristics of disease. For CD patients, surgery and having an ostomy is not considered or advocated as a cure. For UC patients, surgery and having an ostomy is almost cure and they have a difference related to the type of ostomy. However, this study is the first to investigate the relationship between depression and resilience in UC and CD patients with ostomy in Korea.

In conclusion, the results of this study may help UC and CD patients with ostomy, which ultimately improve their depression and strengthen their resilience. Based on this study, we recommend counselling to wound ostomy continence nurses (WOCNs) about their goal setting, facilitating adaptation of disease and ostomy in clinical setting. And we expect that WOCNs adopt a formalised and tailored long-term approach or program to follow up for UC and CD patients with ostomy.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest in relation to this work.

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