Effect of Educational Program about Biological Therapy on Nurses Performance in Caring of Patient with Inflammatory Bowel Disease and its Activity Grade

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Abstract:
The inflammatory bowel disease (IBD) nurse specialitis plays a key role in the management of IBD patients who undergoing biological therapy. **Aim:** Assess the effect of educational program about biological therapy on nurses' performance in caring of patient with IBD and its activity grade. **Subjects and methods:** All nurses (40) in the Tropical Medicine and Gastroenterology department and outpatient clinic at Assiut University Hospitals, in addition to a sample of 80 IBD patients (forty patient with crohn's disease and another forty patient with ulcerative colitis) who underwent biological therapy, all were assessed before and after the implementation the nursing educational program. **Tools: Tool 1:** Structured questionnaire to assess nurses` demographic data and knowledge about biological therapy, **Tool 2:** observation checklist for nurses` practice. **Tool3:** Patient disease activity scales, and Nursing educational program about biological therapy administration. **Results:** It found that a highly statistically significant improvement in nurses' knowledge & practice scores after implementing the nursing educational program P<0.001. There was a highly statistically significant difference regarding the IBD activity grade in the studied patients' pre/post program implementation (p< 0.001). **Conclusion:** The nursing educational program had a highly statistically significant positive effect on nurses' performance and promoting IBD activity grade of patients following the biological therapy administration. **Recommendations:** Nurses should have a written clinical booklet on safe biological therapy administration is recommended to be established.

Keywords: Biological Therapy, Educational Program, Inflammatory Bowel Disease activity grade & Nurses Performance.

Introduction:

Biological therapy is a type of treatment that involves using parts of the body's natural immune system to treat inflammatory bowel disease. **(Mattos et al., 2015)**

The IBDs are a group of diseases marked by chronic inflammation in the absence of an infectious pathogens. Major diseases listed in this group are Crohn's disease (CD) and ulcerative colitis (UC). Chronic intestinal inflammation, with remission and flare-up stages, is one of these disorders. Abdominal discomfort, vomiting, diarrhea, flatulence, blood in the urine, frequent need to defecate with a sensation of incomplete bowel emptying (tenesmus), and weight loss are the most typical symptoms. **(Actis et al., 2019).**

Infliximab, an antitumor necrosis factor (anti-TNF) medication, is effective in treating moderate-to-severe CD and UC in young adults. The higher infliximab levels were associated with mucosal healing among the patients with CD and the same effect was observed with UC patients **(Vulliemoz et al., 2020)**.

Patients require information on biological therapy, including the type of medication, predicted adverse effects, dosage, and administration technique, as well as the expected treatment schedule and tests required for progress monitoring. Patients and their families require knowledge in order to make informed decisions regarding their own care. Patients may have a variety of inquiries about specific situations. Patients may have a range of questions about specific scenarios, such as when and where to call if a fever develops unexpectedly. What should do if they have a rash? and Whether or not other medications, such as over-the-counter treatments, are compatible with IBD treatment. (**Dibley et al., 2017**).

The nurse forms a strong bond with the patients and becomes the first person to whom the patients refer their problems. The role of the IBD nurses in biological therapy is not only administrating biological drugs intravenously but can manage possible side effects that result from the therapy administration such as (how to mange the infusion rate and allergic reactions) and ensure safe administration of biological therapy, by modifying the drug's rate of administration , dose and double-checked before actual administration) . Furthermore, the IBD nurse provides the patients with all information needed about biological therapy **(Guarini et al., 2017)**.

Significance of study:
From the researcher, clinical experience found that the nurses who are worked in in the department of Tropical Medicine and Gastroenterology and outpatient clinic at El Rajhi liver Hospital at Assiut University Hospitals does not have adequate knowledge about biological therapy. The study conducted by **Mostafa et al., 2018 entitled** found a low prevalence of IBD. In Egypt, however, the incidence of IBD has increased in recent years, presumably due to improved awareness . The IBD clinic at Cairo's Hepatology Institute began in 2009. Some complex cases necessitate biological treatment, which could not have been brought solely as a donation. Years later, the government has backed these high-priced drugs. Furthermore, preliminary results from 2017 revealed that one hundreds of patients were followed 64% UC, CD 29.7%, and indeterminate colitis 6.3%). Approximately 57 percent had moderate to severe activity, and approximately 30 percent required biological treatment. (**El bassyouni & Elatrebi., 2017**).

Aim of the study:
General objective: Evaluate the effect of designed a nursing educational program on nurses' knowledge and practices related to biological therapy administration and its effect on improving the IBD activity grade among the studied patients.

Specific objectives:
1. Assess nurses' level of the knowledge and practice regarding biological therapy administration.
2. Design a nursing educational program about the biological therapy administration for nurses working with IBD patients.

Research hypothesis:
H0: After nursing educational program implementation, there is no statistically significant difference nurses' knowledge and practice regarding biological therapy and degree of the IBD activity.

H1: With increase the nurses' knowledge and practice about correct methods of biological therapy administration, the disease activity will be reduced among the IBD patients.

Operational definition:
Slightly Below Par: The patient feels good but not great. The patient can work, socialize, and function on a day-to-day basis.

Subjects and Methods:
Research design:
Quasi experimental (pre/posttest) research design.

Sample and setting
All available nurses (40) in the department of Tropical Medicine and Gastroenterology and outpatient clinic at El Rajhi liver Hospital at Assiut

University Hospitals and 80 IBD patients; 40 for each major type (CD and UC) who receiving a biological therapy for IBD throughout a six-month period, from both gender, with ages ranging from 18 to 65 were recruited in this study.

Sample size: In this study sample size of the studied patients was calculated by using the epi- info program with a confidence level at 95% and the flow rate of IBD patients 270 cases in 6 months so the sample was calculated to be 83 patients 3 patients drop out during the data collection, only 80 patients agreed to participate and completed the study period that divided into two groups in a randomized way according their diagnosis.

Variables: The nursing educational program is the independent variable in this study, while the dependent variables are the nurse's knowledge and practices, as well as the patient's IBD disease activity grade.

Tools:
Tool 1: Structured pre/posttest questionnaire for nurses: It consisted of two parts:
Part I: Demographic data for nurses:
Part II: Pre/post test questionnaire sheet for nurses to assess their knowledge about biological treatment for IBD patients. It consisted of 13 questions about IBD and biological therapy.

Scoring system:
Total score was (13) degrees. One score was given for each right answer and zero for wrong answer. Nurses who obtained less than 60% were considered having unsatisfactory level of knowledge, while those who obtained more than 60% were considered having satisfactory level of knowledge.

Tool 2: Pre/post an observational checklist for nurses: It used to investigate nurses' practice in administration of biological therapy. It consisted of the following 9 main items:
- Nursing assessment of patient who underwent biological therapy administration included (11 items).
- Specific considerations for handling of monoclonal antibodies included (4 items).
- Preparations of infliximab included (`15 items).
- Storage included (3 items).
- Managing Infusion Reactions include (mild to moderate infusion reactions included 4 items and severe infusion-related hypersensitivity reactions included 3 items)
- Medication Administration and Monitoring included (5 items).
- Monitoring included (2 items).
- A few prevention measures can prevent or reduce allergic reactions with rituximab included (3 items).
- Documentation.

- Scoring system: Each item was observed, categorized and scored into either 'done correctly =1, or not done =0. The total score for all items was 46. Those who obtained less than (60%) were considered having inadequate level. While those who obtained above than (60%) were considered having a dequate level.

Tool 3: Patient disease activity scales:

Patients' Personal Characteristics: it included age, gender, marital status, occupation, and level of education.

Modified Harvey Bradshaw Index Assessment Scale for CD activity: Modified Harvey Bradshaw Score developed by **Harvey & Bradshaw 2016**. It is a comprehensive discriminative tool aimed to assess the degree of CD activity.

It consists of four clinical parameters: General well being   (Very well = 0 ,   Slightly below Par = 1, Poor = 2,   Very Poor = 3,   Terrible = 4) Abdominal pain, (one = 0, Mild = 1, Moderate = 2, Severe = 3) ,numbers of liquid or soft stools per day (yesterday) and physician's assessment (None = 0, Arthalgia = 1 , Uveitis = 1 , Erythema Nodosum = 1 , Aphthous ulcer = 1 ,   Pyoderma gangrenosum = 1 , Anal Fissure = 1 , New Fistula = 1 ,   Abscess = 1). The first, second and third parameters asked for patient to answer and the fourth parameter for physician to answer. The numerical results provide a score that represented an estimate of CD activity. The cumulative scores for this scale vary from < 5 to >16. In classification: < 5 = remission, 5-7 = mild disease, 8-10 = moderate disease and >16 = severe Disease.

Partial Mayo scoring index assessment scale for ulcerative colitis activity: The clinical Mayo Score or partial Mayo Score (PMS) developed by **Rutgers, et al., 2005**. It consisted of three clinical parameters (fecal frequency, bleeding per rectum, and physician's global assessment). The first and second parameters asked the patient to answer and the third parameter to the physician to answer. The numerical results represented an estimate of the degree of UC severity.

Scoring system: Each clinical parameter is assigned a score from 0 to 3 according to the clinical evaluation. Calculation formula: Add the scores of the three parameters. Clinical response is defined as a decrease of at least 2 Mayo Clinical Score. The total score can be categorized to Remission = zero to one, Mild Disease = two to four, Moderate Disease = five to six, and Severe Disease =seven to nine.

Construction of nursing educational program:
It was planned to cover the knowledge and practice that can help nurses to provide safe measures for patients receiving biologic treatment for inflammatory bowel disease.

The nursing educational booklet was designed by the researchers according to the literature review, researchers' experience, and the opinions of medical and nursing expertise. It becomes formulated and brought to the nurses in sessions. It has been written in an easy Arabic language with clear illustrations and diagrams. The nursing educational booklet included information about: (definition of IBD, indications of biological therapy, route of biological therapy administration, dose of the drugs, foods that avoided or refrained during the biological therapy treatment, nursing instructions about clinical monitoring the immediate and late side effect of biological therapy and how to manage these side effects, schedule of drug administration, signs and symptoms that should be consult the doctor when occur).

Content validity and reliability:
a) For validity assurance purpose, the tools had been submitted to a panel of 5 experts in fields of medicine and nursing who reviewed the tools for clarity,   relevance,   comprehensiveness, understanding, applicability, and the ability for application.

b) Reliability of the tool 1 was performed and calculated statistically. The Cronbach's values were measured for part 2 (Pre/post test questionnaire sheet for nurses) was (0.8), and Tool 2 (Pre/post an observational checklist for nurses) was (0.9). Tool 3 (Patient disease activity scales) was (0.956).

Pilot study: was carried out on 10% of the total subjects (4 nurses and 8 patients). Subjects involved in the pilot study were including within the actual study sample because no modifications of data collection tools were done.

Ethical Considerations The study was followed common ethical principles in clinical research. The proposal of the current research was approved by the ethical committee in the faculty of nursing. There was no risk for the study subject during the application of the research. Informed consent was obtained from the patients who were willing to participate in the study after explaining the nature and purpose of the study. Nurses & patients had the right to refuse to participate and/or withdraw from the study without any rationale and at any time to maintain anonymity.

Data collection (fieldwork)
- The researcher started to collect data (the pretest) was done from the 1st of November 2020. It was taken about 2 months.
- Time take for(implementation phase) it was taken three months
- Time taken for the evaluation phase (post-test), it was taken 2 months.
- The total period for data collection was (24 weeks) about 6 months period from 1st of November 2020 to 31 of April 2021

Procedure: data collection was done through the following phases:

I: Preparatory phase:

Needed administrative permissions obtained, assessment of the study setting for the possibility of meeting nurses and patients for assessment and implementation of the nursing program.

The researcher developed tools (I&II) after reviewing the related literature. At the first interview, researchers introduced themselves to initiate line of communication, and then explained the nature & purpose of the study. Time of data collection decided according to the studied sample time in the morning shift after coordination between the researcher managers of the departments and outpatients' clinics.

II: Implementation Phase:

Regarding the nurses:

The researchers explain the nature of this study and the goal. Then they

Asked the nurses to fill out the structured pre/post test questionnaire (tool 1 part II) to assess their knowledge before implementing the nursing educational program. The researchers filled out the observation checklist to evaluate the practice of nurses before implementing the program of nursing education (tool 2).

Teaching sessions with nurses were scheduled, and nurses were divided into small groups (each group 2 - 4 nurses). Each group of nurses was given the freedom to choose the optimum time to receive the nursing program whenever they had a minimal workload. Each set of nurses received 4 sessions. Each session was 40 minutes long, of which 20-30 minutes were for discussion. A Nursing Education

Handbook was provided to each nurse. Teaching reinforcement has been conducted according to the nurses' needs to ensure understanding.

Regarding the patients:

Before the application of the nursing program on patients the researchers assessed patients' personal and disease activity degree using (Tool 3) to take the baseline data (pre-test). It took about 30 minutes, about 3-4 patients per day/ twice weekly.

II: Evaluation Phase:

Regarding the nurses:

Immediately after application of the nursing educational program, the researchers evaluate the nurses' performance (as a post-test) using the previously mentioned tools (1 and 2) to evaluate the effect of the nursing education program on nurses` knowledge and practice.

Regarding the patients:

The two groups were followed up to evaluate the effect of implementing a nursing education program on improving the degree of IBD activity using (Tool 3).

Statistical analysis

The collected data were tabulated and statistically analyzed to assess the differences between the studied groups using frequencies and percentages with mean ± SD using (SPSS) version (26). Independent sample T-test, Chi-square tests, one-way ANOVA, and Pearson's correlation test were used for the relationship between variables. It is considered significant when the value of P is < 0.05, highly significant $P<0.001$ and non-significant when $p > 0.05$.

Results:

Table (1): Frequency and percentage Distribution of Demographic Characteristics for the studied Nurses

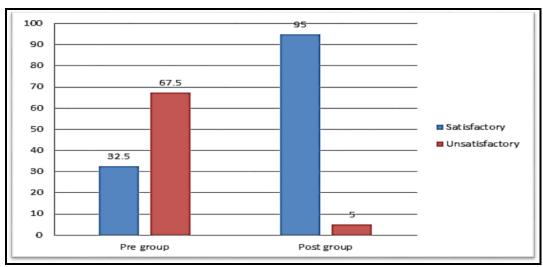| Item	Nurses	
	N(40)	**(%)**
Gender:		
Male	0	(0.0 %)
Female	40	(100.0 %)
Age		
18 - 25 years.	4	(10.0 %)
26 - 35 years.	26	(65.0 %)
36 - 45 years.	10	(25.0 %)
Mean± SD	30.3±5.3	
Education		
Diplom 3 years	18	(45.0 %)
Technical institute	19	(47.5 %)
Bachelor of nursing	3	(7.5 %)
Years of experience		
< 1 year	1	(2.5 %)
1 – 5 years	5	(12.5 %)
6 – 10 years	18	(45.0 %)
> 10 years	16	(40.0 %)
Mean± SD	11.1±5.4	
Attending training		
No	40	(100.0 %)

Figure (1): Percentage distribution of total level of nurses` knowledge pre and post implementing the educational Program.
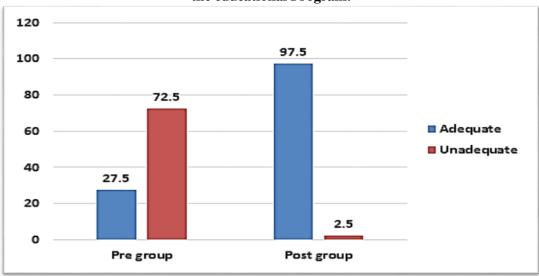

Figure (2): Percentage distribution of total level of nurses` practice pre and post implementing the educational program.

Table (2): Frequency and percentage of the studied distribution patients' Personal Characteristics.

Item	Crohn's Disease Patients (N=40) N. (%)	Ulcerative Colitis Patients (N=40) N. (%)
Gender:		
Male	13 (32.5%)	18 (45.0 %)
Female	27 (67.5%)	22 (55.0 %)
Age		
18-25 yrs.	14 (35.0%)	18 (45.0 %)
26-35 yrs.	21 (52.5%)	21 (52.0 %)
> 35 yrs.	5 (12.5%)	1 (2.5 %)
Mean± SD	**27.6±5.7**	**32.1 ± 5.9**
Education		
Read and write	6 (15.0%)	5 (2.5 %)
Secondary	25 (62.5%)	20 (50.0 %)
Bachelor	9 (22.5%)	15 (37.5 %)

Item	Crohn's Disease Patients (N=40) N. (%)	Ulcerative Colitis Patients (N=40) N. (%)
Occupation		
Yes	30 (75.0%)	25 (62.5 %)
No	10 (25.0%)	15 (37.5 %)
Marital Status		
Single	17 (42.5%)	14 (35.0 %)
Married	23 (57.5%)	26 (65.0 %)

Table (3): Relation between the Crohn's Disease Activity degree among the studied patients pre and post implementing nursing educational program:

Modified Harvey Bradshaw Index	Pre- test (N=40)		Post- test (N=40)		P-value
	N	%	N	%	
Remission <5	0	0.0	11	27.5	
Mild = 5-7	2	5.0	17	42.5	0.001 **
Moderate = 8-16	15	37.5	11	27.5	
Severe >16	23	57.5	1	2.5	
Total	**40**	**100.0**	**40**	**100.0**	

*One way ANOVA-test   (P>0.05) = no significant   (P<0.05) =*significant*
*(P<0.005)= **highly significant   (P<0.0005) = ***very highly significant*

Table (4): Relation between patients' groups for Ulcerative Colitis Activity degree among the studied patient pre and post implementing nursing educational program:
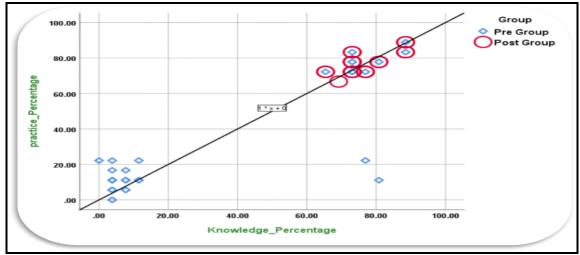
Ulcerative Colitis Activity	Pre- test (N=40)		Post- test (N=40)		P-value
	N	%	N	%	
Remission = 0 - 1	0	0.0	10	25.0	
Mild Disease = 2 - 4	10	25.0	23	57.5	0.001 **
Moderate Disease = 5 - 6	6	15.0	7	17.5	
Severe Disease = 7 - 9	24	60.0	0	0.0	
Total	**40**	**100.0**	**40**	**100.0**	

*One way ANOVA-test   (P>0.05) = no significant   (P<0.05) =*significant*
*(P<0.005)= **highly significant   (P<0.0005) = ***very highly significant*

Pearson correlation coefficient= 0.702
Figure (3): Correlation between the studied nurses' knowledge and practice regarding biological therapy administration pre and post implementing educational program.

Table (1): Showed that, the mean age of the studied nurses was (30.3 ± 5.3) and all the nurses were females and more than two-fifth of the nurses had technical institutes and 6-10 years of experience. Finally, no nurses were trained to administer biological therapy.

Figure (1): Displayed that there was a highly statistically significant difference between nurses' knowledge about administering biological therapy to enhance IBD activity before and after implementing a nursing education program.

Figure (2): Enumerated that more than two-thirds of nurses (72.5%) were having an inadequate level of practice pre implementing the nursing educational program, however, post its implementing majority of them (97.5%) were having adequate practice level.

Table (2): Expressed that, more than half of the patients with Crohn's disease and ulcerative colitis were females with mean age (67.5 ± 55.0) respectively, and more than half of them were married (57.5% ±65.0%) respectively.

Table (3): Showed that there was a highly statistically significant difference in the patients' disease activity degree after implementation of the nursing education program than before. (P = 0.001).

Table (4): Showed that there was a highly statistically significant difference in the studied patients' disease activity degree after implementation of the nursing education program than before. (P =0.001).

Figure (3): Disclosed that, there was a positive correlation between nurses' knowledge and practice regarding biological therapy administration after implementing the nursing educational program with P- value=0.702**.

Discussion:

The IBD are chronic inflammatory diseases of the gastrointestinal tract that include CD and UC (**Siew et al., 2017**). Patients with IBDs are complex patients who face a variety of clinical problems. This complexity necessitates the involvement of a multidisciplinary team, and an IBD nurse can serve as a vital link between the doctor and the patient. The aim of this study is firstly to assess nurses' level of knowledge and practice regarding biological therapy administration and secondly, design a nursing educational program about the biological therapy administration for nurses working with IBD patients and finally to evaluate the effect of designed a nursing education program on nurses' knowledge and practices related to biological therapy administration and its effect on improving the IBD activity degree among the studied patients.

The current study findings showed that all nurses were female this is consistent with the study of **de**

Barros et al., (2020) conducted on the nurses to evaluate the Impact of an Educational Intervention on IBD for Nurses in Brazil the sample was predominantly composed of gender females (66.67%) (**Federal Nursing Council., 2017]** . All of them had no in-service training courses related to safe biological therapy administration. More than two-fifth of their experiences were from 6 to 10 years. So it was concluded that the nurses were not properly prepared before they graduated and started serving patients with IBD especially those receiving biological therapy. Their real experiences were gained while working in the Tropical Unit only. However, the researcher imagined that there should be an ideal training program designed for a the assigned nurses and other health team members ahead of time to be capable of dealing with such group of patients.

Nurses' knowledge regarding biological therapy:

The present study result found that the majority of the studied nurses' had unsatisfactory total level of knowledge. This may be related to the fact that most of them had no previous training regarding administering safe biological therapy. This is also due to the fact of this new treatment in its use for IBD patients, and the nurses have no knowledge of the best way to give such treatment.

In the same line, **Kemp et al., (2018)** reported that a trained nursing staff in the tropical unit as part of promoting the IBD activity is essential and has a positive treatment efficacy and treatment outcomes. Nurses must be prepared to properly handle such medications at the postgraduate level by participating in a specialized or continuing education program.

Also, The intervention course encouraged an improvement in IBD knowledge of the participating nurses, particularly on aspects related to IBD signs and symptoms and the care during infliximab infusion (**De Barros et al., 2020**).

Graduation courses do not provide the necessary skills that professionals need. Continuing education courses are important tools for training professionals who work with IBD patients. The educational intervention raises the knowledge of the participants, assures them of theoretical and practical knowledge, and favors a trusting relationship between the patient and the health team (**Macêdo et al. 2019**).

According to the Nurse European Crohn's and colitis organization (N-ECCO), nurses caring for IBD patients need basic knowledge of the diseases, such as the difference between UC and CD, issues related to medications, surgical options, and key diagnostic and treatment strategies. Furthermore, nurses need to know how to measure disease activity, issues with biological therapy, and major extra-intestinal manifestations. (**Kemp et al., 2018**).

The results of the current study showed that the studied sample reached the level of satisfactory knowledge after implementing the nursing educational program. This may be due to all studied nurses in all age groups have a strong desire to learn new knowledge as well as the written material about nursing care guidelines for patients undergoing biological therapy distributed to nurses used as an ongoing reference, which was helpful in nurses' acquisition of knowledge. In addition, the application of adult learning rules throughout the educational sessions with encouragement of questions, participation and interactions along the intervention as well as the use of multimedia. This finding was consistent with the study conducted **by de Barros et al., (2020)** who showed a statistically significant difference in knowledge about symptoms of major IBD (64.29% vs 96.30%, p = 0.0224), and about infliximab infusion (35.71% vs 74.07).%, p = 0.0404).

Nurses' practice regarding biological therapy:
There was an inadequate total level of nurses` practice regarding biological therapy administration for IBD patients before implementation of the nursing educational program. Whereas more than two-thirds of nurses didn't perform adequate practice with regard to the administration of biological therapy. This may be due to all studied nurses did not have an in-service training program related to the management of biological therapy and did not have sufficient information on measures taken about the administration of biological therapy to improve the degree of IBD activity.

Meanwhile total adequate levels of nurses' practice were observed after the implementation of the nursing education program. This has been concluded by the presence of a positive correlation between nurses' knowledge and practice regarding biological therapy administration after implementing the nursing educational program with P- value=0.702**. From the researcher's point of view, the skills can be easily improved, especially if linked with their relevant scientific base of knowledge, also indicted the importance of applying this type of program to the nurses who care for these patients and administered the biological therapy

Training the nursing team in theoretical knowledge and behavioral skills to provide information about the disease, its complications, and healthy lifestyles is critical, and the researcher can mention permanent health education as a tool for training and development of health professionals, which is characterized by "learning at work, where learning and teaching are incorporated into the daily life of work." **(Ministry of Health (Brazil), Office of the Minister., 2004).** After attending regular nursing educational sessions, nurses' knowledge and practice improved noticeably. **(Youssef 2007).**

The studied patients' disease activity degree:
In the present study more than half of the patients with CD and UC, were females and with mean ages of 276±5.7 and 32.1± 5.9 respectively.

Regarding the severity of the disease; there was high statistically significant difference among the patients with CD and UC through utilizing partial Mayo and Harvey Bradshaw scoring index assessment after three months from implementation of nursing educational booklet. Whereas, more than two fifth of patients with CD was categorized as having a mild stage of disease, and more than half of patients with UC was categorized as having a mild stage of disease, which was considered highly significant positive results in decreasing the disease activity. Improving nurses' knowledge and practice, according to the researchers' opinion, had a significant influence on patients' commitment to biological therapy session intake, particularly infliximab intravenous infusion, which can reduce or improve disease activity. These current study results are inconsistent with **Maser et al., (2006)** who mentioned that on their prospective study of 105 patients with moderate-severe CD and founded that higher serum concentration of infliximab correlated with a significantly increase the rate of clinical remission and higher infliximab trough level was also associated with mucosal healing in patients with CD **Van et al., (2010)**. Also, the study results of **Seow et al., (2010)** were agreeing with the current study results as they mentioned that on the cohort study of 115 patients with UC had similar results observed in the pre-mentioned study.

The conducted studies showed that the presence of an IBD nurses improve the quality of care for the patient with IBD **(Coenen et al., 2017)** and nurses specialists are essential to the multidisciplinary team, composing the core team along with the medical team **(Panés et al., 2014)** .

Conclusion:
There was a highly statistically significant improvement in the degree of disease activity for IBD patients in both groups after the application of the nursing education program than before. There was a positive correlation between nurses' knowledge and practice regarding biological therapy administration after implementing the nursing educational program.

Recommendation:
- The educational program should be implemented for all nurses caring of patients with IBD as a part of hospital policy.
- Distribute the developed educational booklet to all nurses working with IBD patients.

- Further studies on larger samples from different geographical areas in Egypt to generalize the results

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