EFFEECT OF REFLEXOLOGY ON QUALITY OF LIFE IN MEDICAL STUDENTS WITH IRRITABLE BOWEL SYNDROME

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Abstract

Background: The most common gastrointestinal (GI) condition is irritable bowel syndrome (IBS), affecting millions of people throughout the world. IBS is a type of functional bowel condition marked by chronic or recurrent abdominal pain that is relieved or worsened by defecation or a change in bowel behavior.

Purpose: To determine the effect of reflexology on quality of life in medical students with Irritable bowel syndrome. **Subjects andMethods:** Sixty female medical student with irritable bowel syndrome aged from 18-30 years old and recruited from out patients clinic in Cairo university student Hospital. They were assigned into two groups: **Group A** : included 30 patients who received medications for consecutive 6 weeks. **Group B**: included 30 patients who received reflexology 60 minute/session, twice/week for consecutive 6 weeks **. Results**: The study's findings revealed that before the treatment, the severity of constipation and quality of life (QOL) score were not significantly different between the two groups ($p>0.05$), but that after the treatment, the severity of constipation was significantly reduced in the reflexology group (p0.05), and that the reflexology group's quality of life (QOL) score was increased ($p>0.05$) compared with control group.

Conclusion: The results demonstrated that reflexology has equal effect on quality of life in medical students with irritable bowel syndrome.

Key words: Irritable bowel syndrome ; Medical students ; Quality of life ; Reflexology

Introduction

The most common gastrointestinal illness is irritable bowel syndrome (IBS), affecting millions of people throughout the world [1]. IBS is a type of functional bowel condition marked by chronic or recurrent abdominal pain that is relieved or worsened by defecation or a change in bowel behavior [2].

Into the clinical diagnosis of IBS, the Rome IV is commonly used . In order to meet the criteria, In the last 3 months, you must have had recurring abdominal pain at least once a week., along with at least 2 or more of the following: connected with evacuation;2) associated with a alteration in stool frequency; and3) related with a alteration in stool form [3]. IBS was classified as diarrhoea (IBS-D), constipation (IBS-C), mixed IBS (IBS-M), and unidentified (IBS-U) in Rome III and IV, built on the percentage of whole gut movements that were slack or stiff [4].

Reflexology is a technique for affecting the health of specific body parts by the pressure to specific zones on the ears, hands, and feet [5]. Reflexology is a complementing intervention which is done to treat illnesses and disorders which had long–term symptoms and require pain managing . Foot reflexology is based on the concept that applying pressure to a certain region encourages the passage of energy from the body to special zones, which can reduce sympathetic nervous system activation, release nervousness, and improve recreation [6]. Reflexology point pressure could reduce pain, stress, fatigue and anxiety through eliciting the release of endogenous endorphins and encephalins , Pressure on the solar plexus, which can be seen in the sole's top and middle thirds, is thought to help the nervous system function better [7].

Purpose of this study:-

To determine the effect of reflexology on quality of life in medical students with irritable bowel syndrome .

Material and methods :-

Study design : randomized controlled study, an independent person chose blindly from sealed envelopes containing numbers generated by a random number generator to assign the participants to groups (A) (n=30) and (B) (n=30). To ensure that each group A and group B received an equal amount of cards, the randomization was limited to permuted blocks.

Two groups pre-test and post-test experimental design.The patients had been divided into 2 equal groups (A&B). Group A (control group): consisted of 30 female medical students received medications(laprix, spasmodigestin, coloverin)that were be prescribed by the physician for consecutive 6 weeks .Group B (study group): consisted of 30 female medical students received medications(laprix, spasmodigestin, coloverin) plus foot reflexology for 60 minute session ,twice/ week for consecutive 6 weeks.

Participants :-Sixty female medical students with IBS would be included in this study they would be recruited from outpatient clinics of Cairo University Student Hospital, referred from physician , They would be divided randomly into two equal number groups, The study was conducted from January 2021 to July 2021,they would sign a consent form Inclusion criteria: Sixty female medical students , their age between 18-30 years old, their age between 18-30 years old[8],Mild to moderate, mixed IBS-subtype .Body mass index(BMI)< 30 kg/m2 .Having baseline stable vital signs(blood pressure-respiratory rate-temperature) .Patient meeting the Rome IV diagnostic criteria for IBS with baseline irritable bowel syndrome severity score ≥ 175 .Active but not involved into competitive sport. Low fiber diet, No pervious reflexology therapy, Exclusion criteria: Participants who met one of the following criteria were not allowed to participate in the trial: Functional and organic gastrointestinal disorders , Intestinal organic or systemic disorders that influence intestinal motility (for example gallbladder pancreatitis, hyperthyroidism, diabetes, chronic renal failure, and neurological disorders), Pregnant and lactating women, Using any drugs that would affect metabolism, Progressive weight loss, .BLoody diarrhea Noctural diarrhea, Open foot wound and any skin lesion into the sole of the foot.

Measures procedures:-

A) Evaluating materials :

1- Informed consent form: (Appendix I)

2-Recording data sheet: All data and information of each student who participated in this study were recorded in a recording data sheet (Appendix II).

3-Body weight and height scale: Medical Equipment Folding Portable Weight and Height BMI Analyzer Health Measurement Equipment Scale, It will be used to quantify the subject's weight and height & calculate the body mass index (BMI)

4-Visual analogue scale (VAS):-

Hayes and Patterson introduced the visual analogue scale (VAS) in 1921 as a pain rating scale1,2,3,4,5,6,7,8,9. Scoring are based on self-reported symptom assessments that are reported with a standard handwriting point inserted at one position along the course of a ten-cm line that

symbolizes a continuity between the two scale ends—"no pain" on the left end (zero cm) and "worst pain" on the right end (ten cm) [9]

5-The Irritable bowel syndrome severity score system (IBS-SSS):-

The IBS-SSS scores is a 5 visual analogue scale (VAS) that can be performed by a clinician or self-reported. It rates the severity of the symptoms of irritable bowel syndrome during the last ten days in terms of stomach pain severity and extent, stomach discomfort, stool rate of recurrence and texture, and interfering with daily activities. Respectively of the 5 sub-scores has a maximal score of 100 points, for a total score of 500 points on the IBS-SSS. Through the trial, a decrease IBS-SSS of at least 50 points was regarded a significant change. A least of ten points decrease or extra of each of the 5 sub-scores was considered an improvement. [10]

6-The Irritable bowel syndrome quality of life Questionnaire(IBS-QOL):

The IBS-QOL questionnaire has thirty four questions that address 8 different topics (dysphoria, body image, activity interference, food avoidance, health worry, sexual dysfunction, social reaction, and relationships). Every item is rated on a 5-point Like scale (with number one being the worst and number five being the best) .Whole marks were translated to a zero to hundred scale, with zero being the maximal quality of life and 100 being the lowest quality of life [11].

7-Bristol stool form scale (BSFS):- The BSFS is an interval scale that ranks stool forms from lumpy which is type number one to soft that is type number seven .The BSFS is often utilized in inpatient and outpatient settings around the worldwide [12]

8-Constipation scoring system (CSS):-

The constipation scoring system questionnaire, a self-reported checklist that assesses the degree of constipation, has been approved for use in clinical research settings. The total rating for constipation scoring system questionnaire runs from zero to thirty, with a high scoring indicating the worst constipation symptom [13].

B-Treatment procedures :

Pillows to support patients' heads and a plinth for them to long site or lie on, Cushions or pillows under patients feet, chair for the therapist, face mask, disposable plastic clean gloves, foot cream or baby oil and clock. Before the therapy, wipe the region with alcohol and cotton. The treatment was carried out in a calm, air-conditioned room.

Treatment procedure - The patient in the study group were instructed to wash their feet with water and soap and come two hours after the last meal. Each patient put off her socks and lie in the plinth in a comfortable supine position with one or two pillows one under her feet and the head ,the feet should be close to each other during foot reflexology.

The physical therapist put on plastic disposable gloves before starting reflexology and washing each area before treatment with alcohol and cotton for feet [14]. - Oil was spread into patient feet to facilitate massage after warming the hands. To loosen up the feet and start preparing for reflexology, techniques of relaxation were used [15]. Imagine a map of the body, reflexology steps were done according to foot chart. Pressure applied on same reflex points for the bowel or the colon (ileocecal valve –ascending colon –transverse colon-descending colon –sigmoid colon-rectal reflex) in each session. Reflexology was done in three stages: the beginning of the massage, the excitation of reflex areas, and the end of the massage) Beginning of the massage:- Heating, relaxing, and adjusting the feet for massage took up the 1st ten minutes of every session. Baby oil, held at room temperature, was used to lubricate and assist rubbing during reflexology. Massage oil was liberally applied to the feet's surface, into the first step then pull the leg, perform thumb walking, hold solar plexus, clamp the foot, and wave the ankle, All this procedures were used to properly warm the feet and stimulate the reflex zones. Excitation of reflex areas: Through the massage, both hands were applied in tandem. While one hand grasped the foot, the other stimulated each point into gut reflex. For 5–10 seconds, the thumb was placed into the reflex area. The "caterpillar like movement" was used to slide the thumb forward onto the reflex zones.After the reflex zones were stimulated, the massage was finished using techniques like holding the solar plexus, thumb like walking motion, patting movement, rubbing motion, and pulling of the legs [16].

Statistical analysis:- The mean age, weight, height .age and body mass index of 2 groups were compared using descriptive statistics and an unpaired t-test, Paired t test had been utilized for comparison between pre and post treatment mean .Unpaired t test was conducted for comparison of VAS, IBS-SSS, IBS-QOL and WCSS between groups. Median values of Birstol Stool Form Scale between group A&B Were compered using Mann–Whitney U test .Median values of BSFS into both groups pre and post treatment were compered using Wilcoxon Signed Ranks Test .All statistical tests were conducted with a significance threshold of $p < 0.05$.The statistical package for social studies (SPSS) version 25 for Windows was used to carry out all statistical analyses.

Results:

Demographic characteristics of the study: The characteristics of the subjects in groups A and B were shown in (Table 1). The mean age, weight, height, and body mass index distribution did not differ significantly between 2 groups.

Table 1. Comparison of the mean age, weight, height and body mass index (BMI) between study and control groups.

	Study group	Control group	MD	t-value	p-value	Sig
	$\bar{X}$ ±SD	$\bar{X}$ ±SD				
Age (years)	**23.4 ± 2.79**	**22.36 ± 2.94**	**1.04**	**1.39**	**0.16**	**NS**
Weight (kg)	**64.03 ± 10.06**	**63.28 ± 9.15**	**0.75**	**0.3**	**0.76**	**NS**
Height (cm)	**161.76 ± 5.98**	**163.5 ± 5.13**	**-1.74**	**-1.2**	**0.23**	**NS**
BMI (kg/m²)	**24.43 ± 3.31**	**23.67 ± 3.28**	**0.76**	**0.89**	**0.37**	**NS**

$\bar{X}$ **: Mean** **SD: Standard deviation** **MD: Mean difference**

t value: Unpaired t value **p value: Probability value** **NS: Non significant**

Effect of treatment on VAS,IBS-QOL,IBS-SSS,BSFS,WCSS:

-Within group comparison:

The VAS, IBS-QOL, IBS-SSS, and WCSS scores in the study and control groups were significantly lower after treatment than before treatment ($p > 0.0001$). The proportion In the study group, the change in VAS, IBS-QOL, IBS-SSS, and WCSS was 62.48 percent, 55.63 percent, and 56.11 percent, respectively .The control group had 23.26 percent, 21 percent, 13.36 percent, and 15.49 percent, while the study group had 23.26 percent, 21 percent, 13.36 percent, and 15.49 percent. The study group's pre-treatment BSFS was 2 (2.25-1) and the post-treatment BSFS was 4 (4-3), while the control group's pre-treatment BSFS was 2 (2-1) and the post-treatment BSFS was 3 (3-3). (4-2).

-Between groups comparison*:*

Pre-treatment, there was no significant difference in any of the measures ($p > 0.05$). When the study group was compared to the control group after treatment, the VAS, IBSQOL, IBS-SSS, and WCSS scores of the study group were significantly lower ($p > 0,05$).While the study group's BSFS increased significantly when compared to the control group.

Table 2. ***Comparison of pre and post treatment mean values of VAS between study and control groups:***

VAS	Pre treatment		post treatment	
	Study group	Control group	Study group	Control group
$\overline{X}$ ±SD	5.41 ± 1.13	5.16 ± 1.3	2.03 ± 1.08	3.96 ± 1.41
MD	0.25		-1.93	
t-value	0.8		-5.94	
p- value	0.42		0.0001	
Significance	NS		S	

$\overline{X}$: Mean MD: Mean difference p value: Probability value

SD: Standard deviation t value: Unpaired t value NS: Non significant S: Significant

Table 3 . Comparison of prior and following the treatment mean values of IBS-QOL among study and control groups*:*

IBS-QOL	Pre treatment		Post treatment	
	Study group	Control group	Study group	Control group
$\overline{X}$ ±SD	42.62 ± 13.69	38.23 ± 12.54	18.91 ± 7.84	30.2 ± 9.95
MD	4.39		-11.29	
t-value	1.29		-4.87	
p- value	0.2		0.0001	
Significance	NS		S	

$\overline{X}$: Mean MD: Mean difference p value: Probability value

SD: Standard deviation t value: Unpaired t value NS: Non significant S: Significant

Table 4. Comparison of pre and post treatment mean values of IBS-SSS between study and control groups:

IBS-SSS	Pre treatment		Post treatment	
	Study group	Control group	Study group	Control group
$\overline{X}$ ±SD	249.86 ± 47.85	239.53 ± 45.99	109.66 ± 31.35	207.53 ± 48.91
MD	10.33		-97.87	
t-value	0.85		-9.22	
p- value	0.39		0.0001	
Significance	NS		S	

$\overline{X}$: Mean MD: Mean difference p value: Probability value

SD: Standard deviation t value: Unpaired t value NS: Non significant S: Significant

Table 5. Comparison of prior and following treatment mean values of WCSS inbetween study and control groups:

WCSS	Prior treatment		Following treatment	
	Study group	Control group	Study group	Control group
$\overline{X}$ ±SD	11.4 ± 2.81	10.33 ± 2.33	5.23 ± 2.02	8.73 ± 2.71
MD	1.07		-3.5	
t-value	1.59		-5.65	
p- value	0.11		0.0001	
Significance	NS		S	

$\overline{X}$: Mean MD:Mean difference p value: Probability value

SD:Standard deviation t value: Unpaired t value NS:Non significant S: Significant

Table 6. Comparison of pre and post treatment median values of BSFS between study and control groups:

BSFS	Pre treatment		Post treatment	
	Study group	Control group	Study group	Control group
Median (IQR)	2 (2.25-1)	2 (2-1)	4 (4-3)	3 (4-2)
U-value	431.5		30.9.5	
p- value	0.76		0.03	
Significance	NS		S	

IQR: Interquartile Range **U-value: Mann-Whitney test value** **p value: Probability value**

NS: Non significant **S: Significant**

Discussion :- The purpose of the present study was to examine the effect of reflexology on quality of life in medical students with irritable bowel syndrome. Statistical significance was defined as a p value < 0.05.. The finding of the study showed that reflexology had a significant effect on quality of life in medical students with irritable bowel syndrome.

The results of this study showed that foot reflexology reduced pain level. These results agreed with ***Samarehfekri et al*** **[17]**who determined the effect of foot reflexology on fatigue, pain, and sleep quality in lymphoma patients. The results of this study indicated that foot reflexology is effective to reduce pain intensity among lymphoma patients. The intervention group received foot reflexology for 30 minutes once a day for three consecutive days, and no reflexology was applied in the control group. The mean pain score in the foot reflexology group decreased from 9.44 ± 0.96 on the day of surgery to 1.32 ± 0.94 on the eleventh day after surgery ($P < 0.001$).)e mean pain score in the control group decreased from 9.36 ± 0.91 on the day of surgery to 4.32 ± 1.68 on the eleventh day after surgery ($P < 0.001$). Pain score significantly decreased three days after foot reflexology compared with the control group ($P < 0.001$). A significant decrease was found despite the completion of the intervention on the eleventh day after surgery ($P < 0.001$)

The findings of this study are reinforced by ***Sayari et al*** **[18]** who observed the effect of foot reflexology on chest pain and anxiety in patients with acute myocardial infarction. The results of this study indicated that foot reflexology is effective to reduce pain intensity among patient with acute myocardial infarction. .Foot reflexology applied for 20 min /3 successive days. The intensity of chest pain in treatment group had significantly lowered after 20 minute /session, than control group ($p < 0.001$).

The finding of this current study revealed that foot reflexology boost quality of life , This results are in consistent with ***Özdelikara and Tan [19]*** who discovered the positive impact of foot reflexology on breast cancer patients' quality of life, Özdelikara and Tan found that reflexology increasing general health and quality of life , In terms of averages for functional and overall health scores, Patients in the therapy group outperformed those in the control group ($p = 0.000$).

This results joined up with **Gozuyesil and Baser [20]** who assessed The impact of foot reflexology on women's vasomotor problems and overall quality of life, The mean scores for the Menopause-specific Quality of Life Questionnaire (MENQOL) (sub-groups improved in both groups (p0.001), with a substantial improvement in the reflexology group (p0.05), In the control group, however, there were no improvements ($p> 0.05$). Reflexology was found to be useful in decreasing vasomotor issues and improving quality of life in ladies who are menopausal.

This results are in consonant with **Dikmen and Terzioglu [21]** who investigated the impact of reflexology and progressive muscle relaxation (PMR) exercises on gynecologic cancer patients' pain, exhaustion, and quality of life (QoL) during chemotherapy, There was a substantial reduction in pain intensity and exhaustion, as well as an improvement in quality of life (QoL), in the reflexology and reflexology Plus progressive muscle relaxation (PMR) groups (p.05).

The results of this study showed that foot reflexology improved bowel habits and constipation, this results came in line with **Anjoman Azari et al [22]** who assesed the effect of reflexology on constipation symptoms, The findings confirmed that foot reflexology can effectively improve constipation symptoms, Out of the 693 papers

collected from the sources and 8 more documents discovered through other resources, 9 sources were thoroughly searched for relevant Randomized Clinical Trials. Foot reflexology ensured a substantial influence on constipation score (SMD:-0.82; 95 percent CI: -1.47 to-0.17; P value=0.0001; I2= 93 percent), according to the meta-analysis (SMD:-0.82; 95 percent CI: -1.47 to-0.17; P value=0.0001; I2= 93 percent .

The present study results agreed with **Inkaya and Tuzer [23]** who studied the effect of foot reflexology on the constipation grade of the elderly patient, they found that foot reflexology was effective in relieving the constipation of elderly people. Foot reflexology massage was given to the treatment group 3 times a week for 30 minutes for one month. The rate of evacuating bowels on two different days enhanced into intervention class in comparison to a control group after reflexology was implemented (P 0.001).

It has been discovered that reflexology improves the quality of life, reduces constipation severity in this investigation.

This results correlated with **Seyyedrassoli et al [24]** who conducted the effect of foot reflexology versus abdominal massage on constipation among orthopedic patients. Foot reflexology was used in one of the treatment group, while abdominal massage was done one session a day for six days. From third day through sixth day of the treatment, the treatment groups significantly differ than the control group (p0. 05). (effect size from 34 percent to 50 percent).

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Declaration of interest:

The authors state that there are no conflicts of interest that may be seen as jeopardising the research's objectivity

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