The Powers of Flowers: Evaluating the Impact of Floral Therapy on Pain and Psychiatric Symptoms in Fibromyalgia

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ABSTRACT: **Background:** Fibromyalgia is a syndrome of unknown etiology that is characterized by widespread pain, which severely impairs quality of life. Several forms of occupational and alternative therapy have demonstrated beneficial effects in fibromyalgia patients.

Objective: To assess the effects of participation in a floral design course on physical and psychiatric symptoms in a cohort of fibromyalgia patients.

Methods: This study was conducted as an observational study. Women diagnosed with fibromyalgia over the age of 18 were recruited to participate in one of two 12-week flower design (floristry) courses. Demographic details, disease activity indices, and anxiety and depression scores were calculated for all participants at baseline, week 12, and study completion. Physical and mental health of the two groups were compared throughout the study time-points.

Results: The study was completed by 61 female fibromyalgia patients who were included in the final analyses; 31 patients participated in the first floristry course and 30 in the second. Significant improvements in the 36-Item Short Form Survey physical and mental health components, visual analog scale, Fibromyalgia Impact Questionnaire, Hamilton Anxiety Rating Scale, and Hamilton Depression Rating Scale scores for the entire study population and for each group separately could be seen following participation in each floristry course.

Conclusions: Participation in a floristry course may lead to a significant improvement in pain and psychiatric symptoms in fibromyalgia patients. These findings highlight the potential benefit of utilizing occupational therapy programs, such as a floristry course, for improving quality of life in fibromyalgia.

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KEY WORDS: fibromyalgia, floral therapy, flowers, occupational therapy

Fibromyalgia is a syndrome of unknown etiology characterized by chronic widespread pain, fatigue, and unrefreshing sleep. The debilitating symptoms of fibromyalgia are often accompanied by additional somatic syndromes such as irritable bowel syndrome, cystitis, and migraine headaches. The average worldwide prevalence of fibromyalgia is 2–4% of the population, and primarily affects women. Fibromyalgia patients are more likely to present with mood and anxiety disorders, thus contributing to the incapacitating effect of unremittent pain and exhaustion [1-4].

Due to the lack of knowledge of the pathogenesis of the syndrome, current treatment modalities in fibromyalgia are primarily focused on alleviating pain and improving quality of life [1]. As such, there is an increased focus in the literature on the efficacy of non-pharmacological treatments [1,2,5,6]. Positive effects of non-conventional therapeutic regimes such as sociotherapy, creative arts therapy, and music therapy on depression and pain in fibromyalgia and trauma patients have been reported [1,2,7-10]. Therapy within natural environments, specifically horticultural therapy or gardening, has also been shown to promote relaxation and have a beneficial impact on mental health and general well-being [11-14].

Flower design and arrangement is a form of occupational therapy in which patients learn how to use floristry methods for self-expression. Although flower design therapy combines elements from art and nature therapy, its efficacy in alleviating pain and mood disorders in fibromyalgia patients has never been evaluated. In this study, we assessed the short- and long-term effects of participation participation in a weekly course on flower design on the physical and psychiatric symptoms in a cohort of fibromyalgia patients.

PATIENTS AND METHODS

STUDY DESIGN

The study was designed as an observational study and lasted 24 weeks. The study was approved by received by ethics com-

mittee of Sheba Medical Center in Israel in agreement with the Helsinki Declaration.

The study population included women diagnosed with fibromyalgia over the age of 18 years. The diagnosis of fibromyalgia was made according to the American College of Rheumatology 2010 criteria by a certified rheumatologist. The flower design (floristry) course lasted 12 weeks and included weekly sessions under the supervision of a trained florist. The flowers were kept by the participants for continuous exposure at home [Figure 1]. Attendance in the first floristry course (between study baseline and week 12) or the second (between week 12 and week 24) was determined according to patient choice and course availability. Patients who missed more than two subsequent meetings of the floristry course were excluded from the final analysis.

Demographic details were collected at baseline for all participants. The following fibromyalgia disease activity indices were calculated at baseline, at 12 weeks, and at study completion for both groups: 36-item Short Form Survey (SF-36), Brief Pain Inventory (BPI), Visual Analogue Scale (VAS), Fibromyalgia Impact Questionnaire (FIQ), and tender point count. The Hamilton Anxiety Rating Scale (HAMA) [15] and Hamilton Depression Rating Scale (HDRS) [16] were used to assess anxiety and depression levels, respectively, at baseline and during both follow-up visits.

STATISTICAL ANALYSES

Chi-square test was used to assess categorical variables between groups, and Student's *t*-test was applied for continuous variables. The mean value of fibromyalgia activity indices (SF-36 physical and mental component summary scores), VAS, BPI, and tender point count), as well as the HAMA and HDRS, were compared between both groups at study initiation, at week 12, and at study completion. The variation was shown as standard deviation. Repeated measure analysis was used to find changes over time (study initiation, week 12, and 24 weeks) and between the two groups. A P value < 0.05 was considered statistically significant. Statistical analyses were performed using IBM Statistical Package for the Social Sciences statistics software, version 25 (SPSS, IBM Corp, Armonk, NY, USA).

Figure 1. Bouquet designed at the interventional sessions

RESULTS

Overall, 70 female fibromyalgia patients were recruited to the study, which included two consequent 12-week floristry courses. Nine patients withdrew from the study; therefore, 61 patients completed the study and were included in the final analyses.

The mean age of the study population was 51 years. There were 31 patients in the first floristry group (group 1) and 30 in the second (group 2). The groups did not differ significantly with regard to baseline measurements of mental and physical health such as the SF-36 components, BPI, FIQ, tender point count, and rates of anxiety and depression; however, the VAS score was significantly higher in group 1 compared to group 2. There was no difference in use of medications for fibromyalgia such as serotonin-norepinephrine reuptake inhibitors, selective serotonin reuptake inhibitors, and pregabalin between groups. There was, however, a significantly higher proportion of reported cannabis usage in group 1 [Table 1].

Table 1. Comparison of demographic details between group 1 and group 2

Parameters at baseline	Group 1 (n=31)	Group 2 (n=30)	*P* value
Age (mean ± SD)	50.6 ± 11	52.9 ± 14.2	0.484
Working %	61.3	60.0	0.348
Married %	45.2	56.7	0.369
Physical Health SF-36 (mean ± SD)	32.04 ± 14.4	42.54 ± 14.99	0.894
Mental Health SF-36 (mean ± SD)	22.05 ± 10.19	27.17 ± 11.1	0.276
HAMA (mean ± SD)	31.1 ± 9.1	33.5 ± 9.6	0.789
HDRS (mean ± SD)	20.68 ± 8.3	18.57 ± 7.8	0.311
VAS (mean ± SD)	8 ± 1.2	7 ± 1.6	0.01
BPI (mean ± SD)	6.17 ± 1.39	6.31 ± 1.32	0.674
FIQ (mean ± SD)	6.14 ± 0.93	5.89 ± 1.13	0.403
Tender points (mean ± SD)	16.58 ± 2.09	16.2 ± 1.9	0.461
SNRIs, SSRIs usage %	22.6	26.7	0.711
Pregablin usage %	22.6	13.3	0.508
Cannabis usage %	46.7	13.3	0.010

BPI = Brief Pain Inventory, FIQ = Fibromyalgia Impact Questionnaire, HAMA = Hamilton Anxiety Rating Scale, HDRS = Hamilton Depression Rating Scale, SD = standard deviation, SF-36 = Short Form Survey 36, SNRI = serotonin-norepinephrine reuptake inhibitor, SSRI = selective serotonin reuptake inhibitor VAS = Visual Analog Scale

*Group 1 attended the first floristry course between week 0 and week 12 (n=31)

**Group 2 attended the second floristry course between week 12 and week 24 (n=30)

Significant improvements in the SF-36 physical and mental health components, VAS, FIQ scores as well as and HAMA and HDRS scores for the entire study population were observed; however, tender point count remained unaffected [Table 2]. When assessing the variation in study measurements in each group separately, we found a significant improvement in all study measurements (except for tender point count) from study initiation to completion of the floristry course. Although the improvement regressed slightly for group 1 throughout the weeks following participation in the floristry course (weeks 12–24), measurements did not return to baseline by the study end [Figure 2].

Table 2. Variation in physical and mental health components throughout the study

Criteria	Participants	Baseline	Week 12	Week 24	*P* value
SF-36 physical health component summary score	All participants (n=61)	37.2	39.96	42.14	0.001
	Group 1*	32.04	37.31	34.04	0.039
	Group 2**	42.54	42.71	50.51	‹ 0.001
SF 36 Mental health component summary score	All participants (n=61)	24.56	28.06	31.5	‹ 0.0001
	Group 1	22.05	30.29	24.97	0.003
	Group 2	27.17	25.77	38.26	‹ 0.001
VAS	All participants (n=61)	7.5	6.67	6.45	0.003
	Group 1	8	5.9	7	‹ 0.001
	Group 2	7	7.47	5.9	‹ 0.001
Tender points	All participants (n=61)	16.39	15.77	15.52	0.052
	Group 1	16.58	15.84	15.45	0.17
	Group 2	16.2	15.7	15.6	0.26
BPI	All participants (n=61)	6.23	9.61	9.79	0.63
	Group 1	6.17	9.69	10.02	‹ 0.001
	Group 2	6.31	9.54	9.57	‹ 0.001
FIQ	All participants (n=61)	6.01	5.55	5.19	0.002
	Group 1	6.14	5.51	5.22	0.008
	Group 2	5.89	5.59	5.18	0.033
HDRS	All participants (n=61)	19.63	17.52	16.19	0.001
	Group 1	20.68	16.9	18.97	0.03
	Group 2	18.57	18.17	13.3	0.006
HAMA	All participants (n=61)	32.4	27.8	23.9	‹ 0.0001
	Group 1	31.1	28.1	23.7	0.001
	Group 2	33.5	27.6	24.1	‹ 0.0001

BPI = Brief Pain Inventory; FIQ = Fibromyalgia Impact Questionnaire, HAMA = Hamilton Anxiety Rating Scale, HDRS = Hamilton Depression Rating Scale, SF-36 = Short form survey 36, SNRI = serotonin-norepinephrine reuptake inhibitor, SSRI = selective serotonin reuptake inhibitor, VAS = Visual Analog Scale

*Group 1 attended the first floristry course between week 0 and week 12 (n=31)

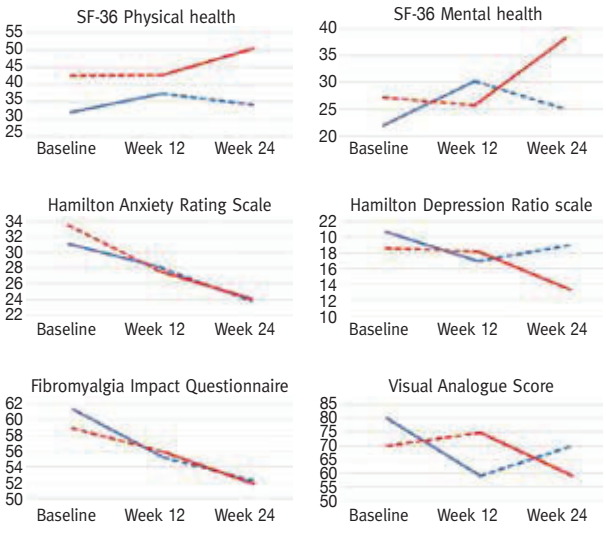
**Group 2 attended the second floristry course between week 12 and week 24 (n=30)

DISCUSSION

Despite the widespread prevalence of fibromyalgia and the significant detrimental effect it has on quality of life, the etiology and pathogenesis of fibromyalgia remain elusive and therapeutic goals focus on symptomatic relief. Current guidelines recommend a multimodal approach comprised of pharmacological regimes, aerobic exercise, and cognitive behavioral therapy. Recently, the role of various alternative interventions, including occupational and art therapy, have come to light as having a potential benefit for fibromyalgia patients [3,5-7,17-19]. In our study, we demonstrated a clear and significant improvement in physical and psychiatric symptoms in a cohort of female fibromyalgia patients following participation in a floristry course.

There is an increasing recognition of the beneficial impact of exposure to natural elements, whether outdoor environments such as parks and forests, or indoor elements such as flowers and houseplants. Engagement with natural elements has been shown to promote relaxation, reduce blood pressure and heart rate, and positively impact stress levels and mood. It has been

Figure 2. Variation in physical and mental health markers of disease activity as compared between both groups throughout the study



*Group 1 attended the first floristry course between week 0 and week 12 (n=31)

**Group 2 attended the second floristry course between week 12 and week 24 (n=30)

hypothesized that natural elements trigger positive emotions as an innate psychophysiological stress relief mechanism and allow restoration from attention fatigue [11,12]. Horticultural therapy, in which patients participate in gardening-related activities, has been shown to have a beneficial effect on mental health in psychiatric and elderly patients [20]. Moreover, significant improvements in pain and psychiatric symptoms was shown in a cohort of chronic pain patients who underwent horticultural therapy, almost half of whom were diagnosed with fibromyalgia [21]. Self-expression via creative art therapy has also been identified as a potential method for alleviation of psychiatric symptoms in patients presenting with trauma and depression [10,22]. Thus, there is a plausible rationale for the significant benefit to physical and mental health markers demonstrated in our study after participation in a floristry course, which combines the process of art therapy with exposure to one of the natural elements: flowers.

In our study, the lasting effect of participation in the floristry course was evaluated at study completion after 24 weeks in group 1, which participated in the course on a weekly basis for the first 12 weeks of the study. Although the positive trend in several study parameters, including SF-36 physical health component, SF-36 mental health component, VAS, and depression scores, was reversed in the following 12 weeks, scores did not return to baseline levels, indicating a persisting impact of the intervention. In contrast, the improvement noted at 12 weeks in anxiety levels and the FIQ score, one of the most validated scales for assessing quality of life in fibromyalgia patients, remained steady at study completion. Other studies have also noted enduring effects of multimodal interventions, sometimes lasting up 1 or 2 years [2,9], and longer lasting, low-intensity regimes appear to have a greater impact on pain in comparison with short-term, intensive regimes [23]. With regard to the tender point count that improved only minimally throughout our study, although the tender point count is known to correlate with the VAS and FIQ scales [24], it was removed from the revised diagnostic criteria for fibromyalgia in 2010 [25] due to the problematic nature and validity of this measurement tool.

LIMITATIONS

This study has several limitations, which should be addressed. First, a comparative analysis of the patients who withdrew from the study was not performed. This omission might have biased our results. However, the dropout rate (12.8%) was relatively low compared to other interventional studies in fibromyalgia patients [1]. Second, the study was performed on a small sample of fibromyalgia patients, thus it is difficult to determine whether our results would be applicable to a larger group. Nevertheless, the best of our knowledge, this is the first study of its kind to assess the use of a floristry course as a therapeutic regime for fibromyalgia patients.

CONCLUSIONS

Our study indicates that participation in a floristry course may lead to a significant improvement in pain and psychiatric symptoms in fibromyalgia patients. These findings highlight the potential benefit of utilizing occupational therapy programs, such as a floristry course, for improving quality of life in fibromyalgia.

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Capsule

Re-skilling the brain

Researchers still do not understand how changes in the brain during learning lead to the acquisition of new skills. Brain–computer interfaces (BCIs) can be used to link neural activity to a response visible on a computer monitor. **Oby** et al. used a BCI with monkeys and found that new neural activity patterns emerged in the motor cortex of monkeys that learned to control the movement of a cursor. Learning to use a BCI is thus associated with new neural activity patterns in the same way as learning to use handheld tools or learning to play the piano. This study showed a direct link between neural learning and behavioral learning, which previously has only been surmised from neural correlates.

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Eitan Israeli

Capsule

Linking protein misfolding and innate immunity

Multiple innate immune sensors undergo rapid assembly into large complexes known as signalosomes. This is an essential step during cellular responses to microbes and danger signals. How this process is regulated to avoid accumulation of potentially toxic protein aggregates remains poorly understood. **Abdel-Nour** and co-authors identified a pathway, dependent on heme-regulated inhibitor, eukaryotic initiation factor 2α, activating transcription factor 4, and heat shock protein B8, which controls the folding and scaffolding of innate immune sensors, allowing optimal proinflammatory signaling. The pathway appears to mirror the endoplasmic reticulum unfolded protein response (UPR), and so was named the cytosolic UPR (cUPR). The cUPR may represent a general mechanism to control protein misfolding in cells.

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Eitan Israeli

Capsule

Immune signatures that differentiated between the two forms of inflammatory bowel disease

Inflammatory bowel diseases (IBDs) are chronic, sometimes debilitating, disorders of the immune system. The two major forms, Crohn's disease and ulcerative colitis, can be distinguished by endoscopy and imaging, but these methods are invasive and costly, particularly for longitudinal monitoring of disease progression and therapeutic response. **Rubin** and colleagues developed a noninvasive, blood-based assay for classification of human IBDs that monitors the subtypes and functions of circulating leukocytes that traffic to the gut in response to breakdown of the intestinal barrier. In a pilot study of 68 individuals, the authors detected immune signatures that differentiated between the two forms of IBD, identified the disease state (flare versus remission), and provided other information about interpatient variability in disease behavior.

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Eitan Israeli

"Those who have no record of what their forebears have accomplished lose the inspiration which comes from the teaching of biography and history"

Carter G. Woodson (1875–1950), American historian known as Father of Black History