


## RESEARCH ARTICLE

# The role of cannabis in treatment-resistant fibromyalgia women

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## Abstract

**Background:** Fibromyalgia is a complex pain-focused syndrome. Previous studies showed that Cannabis is efficacious in promoting sleep, deepening and lengthening the sleep cycle, and good pain relief (compared with the SSRIs and SNRIs).

**Purpose:** This study aimed to use the World Health Organization Quality of Life Bref questionnaire (WhoQoL-bref) to characterize the impact of Cannabis Treatment initiation on the quality of life in women suffering from treatment-resistant fibromyalgia.

**Methods:** A prospective cohort study involving 30 women aged 18–70 years old diagnosed with fibromyalgia, exhausted pharmacological fibromyalgia treatment, and started Cannabis treatment. Pregnant women were excluded.

WhoQoL-bref was filled before Cannabis treatment initiation and 1 month following treatment.

**Results:** Women's average age was 46 years ( $\pm 5$ ), with a poor general quality of life ( $1.47 \pm 0.63$ ), poor general health ( $1.47 \pm 0.78$ ), pain and discomfort, and dependence on medication ( $3.77 \pm 1.3$  and  $3.07 \pm 1.74$ , respectively) prior to Cannabis intervention. Cannabis treatment for 30 days showed a marked improvement in general quality of life (1.97 scores,  $p < 0.01$ ), general health (1.83,  $p < 0.01$ ), physical health (1.5,  $p < 0.01$ ), and psychological domain (1.3,  $p < 0.01$ ). Financial resources and home environment were not influenced by cannabis treatment ( $p = 0.07$ ,  $p = 0.31$ , respectively).

**Conclusion:** Results suggest a potentially significant role of Cannabis in treatment-resistant Fibromyalgia women. Early Cannabis treatment may result in a beneficial short-term effect on the quality of life through its influence on pain, sleep, and physical and psychological domains. Further studies are still indicated to understand this potential and its long-term beneficial impact.

## KEYWORDS

cannabis, fibromyalgia, pain, quality of life, treatment, woman

## INTRODUCTION

Fibromyalgia is a pain-focused syndrome involving diffuse chronic myalgia, somatization, sleep disturbances, and cognitive and functional impairments affecting approximately 3% of the general population, mostly following trauma, motor vehicle accidents, acute febrile disease, or mental illness stress.<sup>1</sup> Women are affected two times more than men.<sup>2</sup> Although extensively

investigated, anatomic or pathophysiological causes for fibromyalgia are still obscure.<sup>2–4</sup>

Fibromyalgia treatment includes non pharmacological,<sup>5–9</sup> pharmacological, or combined strategies. Non pharmacological treatment includes education,<sup>10</sup> cognitive therapies,<sup>11–15</sup> and passive versus active physical therapies.<sup>16–20</sup> Passive treatment modalities may include massages, acupuncture,<sup>21</sup> and additional alternative medicine treatments,<sup>8,13,22–24</sup> while active physical therapies

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include physiotherapy, hydrotherapy, yoga, Pilates, and aerobic activities.<sup>16–20</sup> Pharmacological treatments consist of analgesics (opiates and non-opiates), non-Steroidal anti-inflammatory drugs (NSAIDs), Tricyclic antidepressants, Selective Serotonin Reuptake Inhibitors (SSRIs), Serotonin–Norepinephrine Reuptake inhibitors (SNRIs), and Gabapentinoids.<sup>25–33</sup> Treatment efficacy can be measured by direct pain level assessment or through assessing the quality of life.

As the worldwide use of Cannabis rises,<sup>34</sup> investigators question its role in treating fibromyalgia as one of the most common pain syndromes nowadays. Throughout history, different cultures used Cannabis to treat pain.<sup>30,31</sup> Modern medicine found the endocannabinoid system's role in the pathophysiology of neuropathic pain.<sup>35</sup> Previous studies showed that Cannabis is efficacious in promoting sleep, deepening, and lengthening the sleep cycle.<sup>36</sup> Other advantages of Cannabis treatment include good pain relief (60% compared to 10% under SSRIs and SNRIs) without significant side effects.<sup>2,37–39</sup>

This study aimed to use the World Health Organization Quality-of-Life Bref questionnaire (WhoQoL–bref)<sup>40</sup> to characterize the impact of Cannabis Treatment initiation on quality-of-life domains in women who have treatment-resistant fibromyalgia.

## METHODS

This study is a prospective cohort study involving 30 women that suffered from non-cannabis treatment-resistant fibromyalgia. A specialized pain physician with north-American fellowship training confirmed the Fibromyalgia diagnosis in all the participants using the American College of Rheumatology criteria<sup>41</sup> and initiated Cannabis treatment.

Inclusion criteria included literate women older than 18 years and younger than 70 diagnosed with fibromyalgia, which exhausted a multi-modal pharmacological fibromyalgia treatment and was found eligible for Cannabis treatment as an add-on to previous treatment and not a single therapy. In Israel Cannabis treatment license is approved only after the exhaustion of combined pharmacological treatment protocols of analgesics, neuroleptics, SSRIs, and opiates. Initial Cannabis treatment consisted of 20 grams per month for the first 6 months. The cannabis route of administration was based on patient preferences, smoking, vaporizing, or ingestion.

Exclusion criteria included ages younger than 18 and older than 70, pregnancy, illiteracy, and cognitive impairment, or women already under Cannabis treatment.

Every woman in the cohort filled out a World Health Organization Quality-of-Life Bref questionnaire (WhoQoL–bref) before Cannabis treatment initiation and 1 month following treatment. WhoQoL–bref is a simple validated tool to evaluate the quality-of-life in various conditions, including fibromyalgia. Four

domains of the WhoQoL–bref were calculated: Physical health, psychological, social relationships, and environment, as well as specific questions within the domains. The whoQoL–bref minimal clinically important difference for this study was 1.<sup>42</sup>

Our Medical Center IRB approved the study.

Study data statistical analyses were carried out using the SPSS 20.0. Differences between pre-treatment and post-treatment WhoQoL–bref were calculated using the Student *t*-test. Pearson's coefficient assessed the correlation between Cannabis treatment and WhoQoL–bref domains.

## RESULTS

The study cohort included 30 women with non Cannabis treatment-resistant fibromyalgia, as determined by a North-American fellowship-trained pain physician. Women's average age was 46 years(±5). No women were lost to follow-up.

Treatment-resistant fibromyalgia patients presented to the pain clinic with the poor general quality-of-life ( $1.47 \pm 0.63$ ), low general health ( $1.47 \pm 0.78$ ), high level of pain and discomfort, and dependence on medication ( $3.77 \pm 1.3$  and  $3.07 \pm 1.74$ , respectively). They also presented with reduced activities of daily living ( $1.47 \pm 0.82$ ). At the same time, environmental factors, such as transport, physical environment, access to health and social care, and financial resources, were relatively high (Table 1), suggesting the contribution of Fibromyalgia-related morbidity instead of environmental restraints.

Cannabis treatment in treatment-resistant fibromyalgia showed a marked improvement in general quality-of-life by 1.97 points out of a 5-point score ( $p < 0.01$ ) and enhanced general health by 1.83 scores ( $p < 0.01$ ) (Table 2). Cannabis treatment also improved the physical health domain score by 1.5 points ( $p < 0.01$ ). Further examination of the physical health subdomains showed a reduction of 1.67 points in pain and discomfort ( $p < 0.01$ ), pain and fatigue ( $1.57$ ,  $p < 0.01$ ), and an improvement of 2.13 points in activities of daily living ( $p < 0.01$ ). Dependence on medication treatment for activities increased by 0.67 points ( $p = 0.05$ ) (Table 1), and since the treatment differed by the Cannabis, this change may be attributed to the cannabis treatment.

Cannabis treatment had a significant positive effect on the psychological domain (1.3 points,  $p < 0.01$ ) and subdomain fields of self-esteem (1.1 points,  $p < 0.01$ ), positive feelings (1.07 points,  $p < 0.01$ ), memory and concentration (1.4 points,  $p < 0.01$ ), recreation and leisure (0.97 points,  $p < 0.01$ ), and sex (1.37 points,  $p < 0.01$ ). Environmental domain (1.05 points,  $p < 0.05$ ), physical abilities ( $p < 0.01$ ), and physical safety and security (1.1 points,  $p < 0.05$ ) showed significant improvements.

A minor degree of improvement was measured in mobility (0.77 points,  $p < 0.01$ ), body image (0.4 points,  $p = 0.02$ ), personal relations (0.83 points,  $p < 0.01$ ), social

**TABLE 1** Pre and postcannabis treatments WhoQoL–bref scores.

	Average pre-treatment	Average post-treatment	Average difference	<i>p</i> -value
General quality of life	1.47 ± 0.63	3.43 ± 1.07	+1.97	<0.01
General health	1.47 ± 0.78	3.30 ± 1.12	+1.83	<0.01
Pain and discomfort	3.77 ± 1.3	2.10 ± 1.18	−1.67	<0.01
Energy and fatigue	1.77 ± 0.86	3.33 ± 1.18	+1.57	<0.01
Sleep and rest	1.47 ± 0.82	3.53 ± 1.20	+2.07	<0.01
Dependence on medication	3.07 ± 1.74	3.73 ± 1.11	+0.67	0.05
Mobility	2.63 ± 1.43	3.4 ± 1.33	+0.77	<0.01
Activities of daily living	1.47 ± 0.82	3.60 ± 1.19	+2.13	<0.01
Working capacity	1.73 ± 0.87	2.90 ± 1.37	+1.17	<0.01
Positive feelings	2.63 ± 1.25	3.70 ± 1.02	+1.07	<0.01
Negative feelings	2.17 ± 1.15	3.13 ± 1.22	+0.97	<0.01
Self-esteem	2.97 ± 1.43	4.07 ± 1.05	+1.1	<0.01
Thinking learning, memory & concentration	1.87 ± 1.04	3.27 ± 1.36	+1.4	<0.01
Body image	3.13 ± 1.41	3.53 ± 1	+0.4	0.02
Personal relations	2.60 ± 1.43	3.43 ± 1.25	+0.83	<0.01
Sex	1.96 ± 1.06	3.33 ± 1.36	+1.37	<0.01
Practical social support	3.20 ± 1.32	3.47 ± 1.33	+0.27	0.02
Financial resources	3.03 ± 1.38	3.47 ± 1.31	+0.43	0.07
Information and skills	3.63 ± 1.35	4.1 ± 0.99	+0.47	0.03
Recreation and leisure	2.20 ± 1.03	3.17 ± 1.34	+0.97	<0.01
Home environment	3.90 ± 1.30	4.07 ± 1.11	+0.17	0.31
Access to health & social care	3.57 ± 1.17	4.13 ± 0.82	+0.57	0.01
Physical safety and security	2.67 ± 1.21	3.77 ± 0.9	+1.1	<0.01
Physical environment	3.23 ± 1.45	3.87 ± 1.22	+0.63	<0.01
Transport	3.60 ± 1.43	4.00 ± 1.17	+0.40	0.04

**TABLE 2** Correlation matrix.

	1	2	3	4	5	6	7	8	9	10
General QOL	–									
General Health	0.894**									
Pain & Discomfort	−0.334	−0.310								
Dependence on Medication	−0.102	−0.17	0.283							
Total score	0.697**	0.715**	−0.47	0.194						
Psychological domain	0.663**	0.602**	−0.172	0.078	0.805					
Self-esteem	0.394*	0.072	−0.145	0.224	0.801*	0.706*				
Environment Domain	0.188	0.001	−0.004	0.145	0.678**	0.363*	0.412*			
Physical health Domain	0.444*	0.386*	−0.123	−0.095	0.731**	0.665**	0.594**	0.274		
Activities of daily living	0.194	−0.115	−0.047	0.046	0.596**	0.463*	0.359	0.545**	0.246	
Access to health & social care	0.84**	0.901**	0.162	0.099	0.422*	0.385*	0.247	0.097	0.471**	0.027

\**p* < 0.05; \*\**p* < 0.01.

support (0.27 points, *p* = 0.02), information and skills (0.47, *p* = 0.03), access to health and social care (0.57, *p* < 0.01), and physical environment (0.63, *p* < 0.01). The change in health access and social care can be attributed to patients' feeling of maximal utilization of medical resources. Financial resources and home environment

were not influenced by cannabis treatment (*p* = 0.07 and 0.31, respectively).

Statistically, the questionnaire's single predicting factor regarding health status and quality of life was physical ability (*t* = 0.386, *p* < 0.05). A higher self-proclaimed physical ability correlates with an improved

self-perceived quality-of-life. Patients correlate QOL with the Health domain ( $r = 0.84$ ,  $p < 0.01$ ) and physical abilities ( $r = 0.44$ ,  $p < 0.05$ ).

## DISCUSSION

The role of Cannabis in treating pain syndromes and fibromyalgia is still under evaluation concerning its efficacy, tolerability, and side effects.<sup>2,37–39</sup> This study assessed the short-term impact of cannabis treatment on the quality-of-life in treatment-resistant fibromyalgia female patients using the WHOQOL Bref. The only intervention applied to the study's cohort was the administration of Cannabis treatment; thus, the change in the WHOQOL Bref is related to this intervention. This study suggests that Cannabis treatment shows short-time improvement in quality of life through its influence on pain, sleep, and physical and psychological domains, surpassing the minimal clinically significant difference.<sup>42</sup> Minor improvements in the environment domain increase the validity of this study since advances in the financial, social, and home environment are not attributable to Cannabis treatment, except for the improvement in general well-being that might reflect diffusely on WHOQOL Bref.

An unexpected result is increased medication dependence following Cannabis treatment (0.67 points,  $p = 0.05$ ); patients may feel greater dependence on Cannabis than on the treatment received previously (analgesics, opiates, and non steroidal anti-inflammatory drugs). This dependence might be due to the improvement in QOL that patients want to preserve, or the novelty of Cannabis treatment, especially following traditional treatment. Another unexpected result was the increase in negative feelings following Cannabis treatment, as opposed to the intuitively expected effect and the overall improvement. Increased positive and negative feelings might indicate emotional lability during Cannabis treatment, but this effect was not examined directly.

The study's limitations include a relatively small sample size, a short follow-up, and the lack of placebo control. Biases include the pre/poststudy design and risk of selection bias. Despite the sample size, the QOL change following Cannabis treatment was statistically significant. Further research should address the long-term effects of Cannabis treatment. Specific psychological evaluation tools should assess mental Cannabis effects. A time or dose-dependent waning of treatment effect should be examined as well.

In conclusion, our results suggest a potentially beneficial role of Cannabis in treatment-resistant Fibromyalgia women. Short-term Cannabis treatment possibly results in a beneficial short-term effect on the quality-of-life through its influence on pain, sleep, and physical and psychological domains. Further studies are still indicated to understand this potential and its long-term impact. Future epidemiologic studies should examine other confounders such as

BMI, anxiety, depression, personality disorders or traits, chronic medical issues, and various regular medications.

## AUTHOR CONTRIBUTIONS

OH and RL collected the data, performed the analysis, wrote the paper, and revised it. YH, NO, and AS contributed to data collection and analysis. All the authors confirmed the last version of the article.

## CONFLICT OF INTEREST

All the authors declare that they have no conflict of interest.

## DATA AVAILABILITY STATEMENT

The data of this case report are available from the corresponding author, Hershkovich Oded, upon request.

## PATIENT CONSENT

Informed consent was obtained from all the patients.

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