To evaluate the impact of Cognitive Behavioral Therapy (CBT) on the severity of the Whiteley Index, health anxiety, depression, and overall quality of life in individuals diagnosed with hypochondriasis.

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Abstract
Background:
Illness Anxiety Disorder, formerly called Hypochondriacal Disorder, involves an overwhelming fear of having a serious illness, despite reassurance from medical evaluations. This ongoing worry can lead to severe anxiety and interfere with daily life.
Aim:
To evaluate the impact of Cognitive Behavioral Therapy (CBT) on the severity of the Whiteley Index, health anxiety, depression, and overall quality of life in individuals diagnosed with hypochondriasis.
Methods:
A quasi-experimental study was conducted with 80 patients diagnosed with hypochondriasis, randomly assigned to either an experimental or control group. The experimental group underwent 13 individual CBT sessions focused on the Whiteley Index, health anxiety, depression, and quality of life, along with treatment-as-usual (TAU). The control group received only TAU. Data were analyzed using both dependent and independent t-tests.
Results:
In this study, the mean age of patients was 36 years in the experimental group and 32 years in the control group, with an average duration of hypochondriasis of 2.7 years in both groups. After receiving CBT, patients with hypochondriasis exhibited a significant reduction in the Whiteley Index, health anxiety, and depression, along with an improvement in overall quality of life.
Conclusion:
Cognitive Behavioral Therapy significantly improves outcomes in patients with hypochondriasis, resulting in a reduction in the Whiteley Index, health anxiety, and depression, as well as an overall improvement in quality of life.
Keywords: *Hypochondriasis, whiteley index, health anxiety, depression, Quality Of Life*

Introduction to Cognitive Behavioral Therapy (CBT)

Cognitive Behavioral Therapy (CBT) is a structured, evidence-based approach designed to address the link between thoughts, emotions, and behaviors. Originally developed to treat depression, it has been adapted for various mental health conditions, including anxiety disorders, mood disorders, and substance abuse. CBT operates on the concept that negative or distorted thinking patterns lead to emotional distress and unhelpful behaviors. By identifying and altering these

thought patterns, individuals can achieve improved emotional regulation and mental well-being (Beck, 2011).

CBT emphasizes practical problem-solving and skill development, enabling patients to actively participate in their own treatment. Treatment typically involves goal-setting and techniques such as cognitive restructuring, behavioral activation, exposure therapy, and problem-solving strategies (Hofmann et al., 2012). CBT is generally short-term, lasting between 8 and 20 sessions, and can be delivered in individual or group formats. This therapy has been shown to be effective for a range of disorders. For anxiety disorders, CBT helps challenge irrational fears, while in mood disorders like depression, it focuses on changing negative thoughts and encouraging rewarding behaviors. In OCD, CBT uses exposure and response prevention to manage obsessive thoughts and compulsive actions. Similarly, it aids trauma survivors with PTSD through cognitive processing therapy. Other applications include treating substance use, eating disorders, chronic pain, personality disorders, and somatic symptom disorders (David et al., 2018).

Health anxiety, or hypochondriasis, involves excessive concern about having a serious illness despite medical reassurance. CBT effectively treats health anxiety by addressing distorted thoughts and behaviors that sustain it (Abramowitz et al., 2014). Key CBT strategies include restructuring cognitive distortions, where patients catastrophize minor symptoms, helping them replace these with balanced interpretations. CBT also targets reassurance-seeking (e.g., doctor visits), teaching patients to tolerate uncertainty. Through exposure therapy, patients confront avoidance behaviors and reduce compulsive symptom-checking. CBT further helps patients manage intense emotions with relaxation techniques and includes relapse prevention strategies to maintain progress (Olatunji et al., 2014). Hypochondriasis, involves excessive worry over developing a serious illness, even without medical evidence. Individuals with IAD misinterpret normal bodily sensations as signs of disease, causing distress and impairment in daily life (American Psychiatric Association, 2013).

IAD is marked by preoccupation with health concerns, often misinterpreting routine sensations (e.g., heartbeat) as illness. Individuals may engage in excessive health-related behaviors, such as frequent symptom-checking or "cyberchondria," and experience heightened anxiety. Health fears often impair relationships, work, and social activities. Persistent reassurance-seeking and

avoidance behaviors are also common (Fink et al., 2015). IAD may arise from cognitive and behavioral factors, with patients displaying heightened sensitivity to bodily sensations. Childhood experiences, like family illness exposure, and stressful life events can exacerbate health anxiety. Psychological vulnerability, especially to anxiety and obsessive thinking, and somatosensory amplification (increased awareness of bodily sensations) are additional contributing factors (Noyes et al., 2008).

METHODOLOGY

Aim: To find out the effect of Application of Cognitive Behavioral Therapy (CBT) on severity of Whiteley Index, health anxiety, depression and Quality of life in patients with hypochondriacal disorder

Study Design: Quasi- experimental study (Pre-posttest control group design)

Sample

The study sample included 80 patients diagnosed with Hypochondriasis Disorder according to ICD-10 DCR criteria (WHO, 1993). The study was conducted at Balrampur Hospital in Lucknow, where patients attending the outpatient department (OPD) were randomly assigned to either the experimental or control group. The study included patients diagnosed with Hypochondriasis Disorder according to ICD-10 DCR criteria. Participants were between 18 and 50 years old, able to speak and understand Hindi or English, and capable of providing informed consent. Only patients with a disorder duration of up to five years were included, and both inpatients (IPD) and outpatients (OPD) were eligible. Patients were required to be on standard treatment. Patients were excluded if they had a substance dependence (with or without psychotic symptoms), a co-morbid psychiatric diagnosis (such as OCD, anxiety, or depression), or any organic illness. Additionally, patients participating in any other psychotherapeutic process were excluded from the study.

Measures

Socio-Demographic and Clinical Data Sheet

A semi-structured form will be prepared to gather personal details of each patient, including name, age, gender, education, and occupation. Additionally, a clinical data sheet will be used to collect detailed information about the patient's illness, including the course, progress, mode, and duration

of the condition.

The Whiteley Index (WI) (Pilowsky, 1969)

The WI is a 14-item self-report questionnaire designed to screen for hypochondriasis. A total score of 7 or higher serves as the cut-off for indicating health anxiety disorder or hypochondriasis. Responses are rated on a 5-point Likert scale, where 1 indicates "not at all," 2 means "to some extent," 3 is "moderately," 4 is "to a considerable extent," and 5 represents "to a great extent." Psychometric evaluations demonstrate that the questionnaire has strong internal consistency and stability, with a test-retest reliability score of 0.81 ($P < 0.001$).

Short Health Anxiety Inventory (SHAI; Salkovskis et al., 2002)

The SHAI is an 18-item measure designed to assess health anxiety independently of a person's physical health status. It evaluates concerns about health, sensitivity to bodily sensations or changes, and fears about potential illness consequences. The scale has high reliability ($\alpha = .89$). Each item is rated on a scale from 0 to 3, with options scored as follows: "a" = 0, "b" = 1, "c" = 2, and "d" = 3.

The Beck Depression Inventory (Beck, Rush, Shaw, & Emery, 1979)

This 21-item self-rated scale is used to assess the severity of depressive symptoms. Each item is rated on a four-point scale from 0 (symptom not present) to 3 (symptom very intense), with total scores ranging from 0 to 63. The scale demonstrates strong psychometric properties, with a test-retest reliability of $r = 0.93$ and internal consistency of $\alpha = .91$.

World Health Organization Quality-of-Life Scale (WHOQOL) (WHO,1995)

The WHOQOL-BREF is a 26-item tool designed to assess quality of life across four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environmental health (8 items). Each item is scored on a five-point scale, ranging from 1 to 5, and scores are then linearly transformed to a 0–100 scale. The scale demonstrates good internal consistency, with Cronbach's alpha values ranging from 0.66 for the social relationships domain to 0.84 for the physical health domain.

CBT Therapeutic Package

The therapy consisted of individual sessions lasting 45 to 60 minutes, which were held twice a week. Each patient in the experimental group participated in a total of 13 sessions, following a standardized treatment protocol. Techniques were adapted from Adrian Wells' *Cognitive Behavioral Techniques of CBT: A Practice Manual and Conceptual Guide*, tailored to the study's specific focus areas.

Visual aids, such as pie charts, diagrams, and images, were used to illustrate how certain techniques could effectively manage health anxiety, illness-related biases, reassurance-seeking behaviors, and hypersensitivity to bodily sensations. Therapists aimed to actively engage patients, helping them achieve their full potential.

The therapy was structured into three phases. The initial phase built rapport and educated patients about their conditions. The middle phase focused on reducing health anxiety episodes, addressing persistent preoccupations, improving social interactions, managing compulsive behaviors, and facilitating cognitive restructuring. The post-treatment phase involved summarizing sessions and reviewing progress.

A key challenge in treating hypochondriacal patients was their inclination to perceive their issues as medical rather than psychological. Engaging them in psychological treatment often required reframing therapy as a hypothesis-testing exercise, as noted by Salkovskis (1989) and Warwick & Salkovskis (1989).

Procedure

The study received approval from the Institutional Ethical Committee of Shree Guru Gobind Singh Tricentenary University. A senior psychiatrist conducted an initial clinical interview to confirm the diagnosis of Hypochondriasis Disorder based on the ICD-10 DCR criteria (WHO, 1993) and to screen for other psychiatric conditions before enrolling participants. After explaining the study's objectives, informed consent was obtained from all participants. Inclusion and exclusion criteria were applied to ensure the study effectively addressed its hypothesis, and socio-demographic and clinical information was collected using a dedicated data sheet.

Before the therapeutic intervention, baseline assessments were conducted to measure whiteley index, health anxiety, depression, and overall quality of life as defined by WHO standards. The

experimental group received a CBT treatment package consisting of 13 individual sessions, each lasting 90 minutes and scheduled twice weekly over two months. During this period, participants also continued their usual treatment (Treatment as Usual or TAU) for Sleep Problems, Anxiety/Panic Attacks, Somatic Symptoms. In contrast, the control group received only TAU. Upon completion of the 13 CBT sessions for the experimental group, both groups underwent post-treatment assessments using the same measures to evaluate changes in their scores.

Statistics Analysis

Statistical analysis was conducted using SPSS v 29.0. The data were tested for normality using the Shapiro-Wilk test. Descriptive statistics, such as mean and standard deviation, were used to describe both socio-demographic and study variables. Parametric tests were applied, including the paired t-test for pre- and post-scores and the independent samples t-test for comparisons between groups, to evaluate changes in dependent variables from the beginning to the end of the treatment.

Results

The present study was aimed to explore the effect of the Application of Cognitive behaviour therapy (CBT) on the level of severity of the Whiteley Index, health anxiety, depression, and quality of life in patients with hypochondriasis disorder. Results after going through the analysis are presented below:

Table: Descriptive Statistics for Socio-demographic Variables (n=80).

Socio-demographic Variables	Experimental Group	Control Group
	Mean ±SD n=40	Mean ±SD n=40
Age (in Years)	36.00±8.28	32.05±7.31
Education (in Years)	12.70±2.43	13.40±2.66
Duration of Illness (in Months)	33.17±12.01	32.55±11.35

This summary presents socio-demographic characteristics of participants in both experimental and control groups. The experimental group had a mean age of 36.00 years (SD = 8.28), while the control group's mean age was 32.05 years (SD = 7.31). The mean illness duration for the experimental group was 33.17 months (SD = 12.01) compared to 32.55 months (SD = 11.35) for the control group.

Table: Comparison of the Whiteley Index's (Hypochondriasis) pre and post treatment scores for the experimental group (n=40).

Variables	Pre Scores n=40 Mean ±SD	Post Scores n=40 Mean ±SD	t-Values	df	p-Value
Whiteley Index (Hypochondriasis)	56.47±3.24	39.15±2.29	30.45	39	0.001

The results of experimental group found significant decrease in the severity of Hypocondrical index (t-value of 30.45 and $p < 0.001$) between pre and post scores of the patients with Hypocondrical disorder due to application of CBT.

Figure: Comparison of the Whiteley Index's (Hypochondriasis) pre and post treatment scores for the experimental group (n=40).

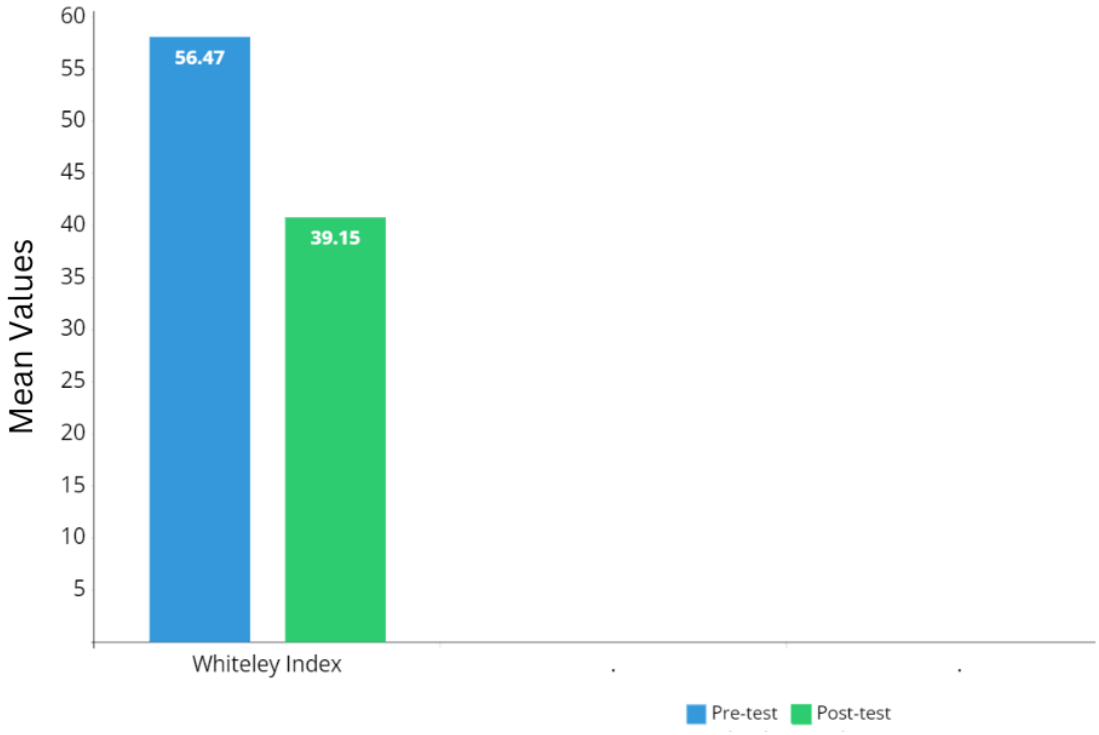


Table: Comparison of the Short Health Anxiety Inventory's pre and post treatment scores for the experimental group (n=40).

Variables	Pre Scores n=40 Mean ±SD	Post Scores n=40 Mean ±SD	t-Values	df	p-Value
Health Anxiety	33.40±1.86	19.55±2.43	89.81	39	0.001
Negative Consequences	09.72±1.51	05.67±1.52	30.28	39	0.001

The results of experimental group found significant decrease in the severity of Health Anxiety (t-value of 89.81 and $p < 0.001$) and Negative consequences (t-value of 30.28 and $p < 0.001$) between pre and post scores of the patients with Hypocondrical disorder due to application of CBT.

Figure: Comparison of the Short Health Anxiety Inventory's pre and post treatment scores for the experimental group (n=40).

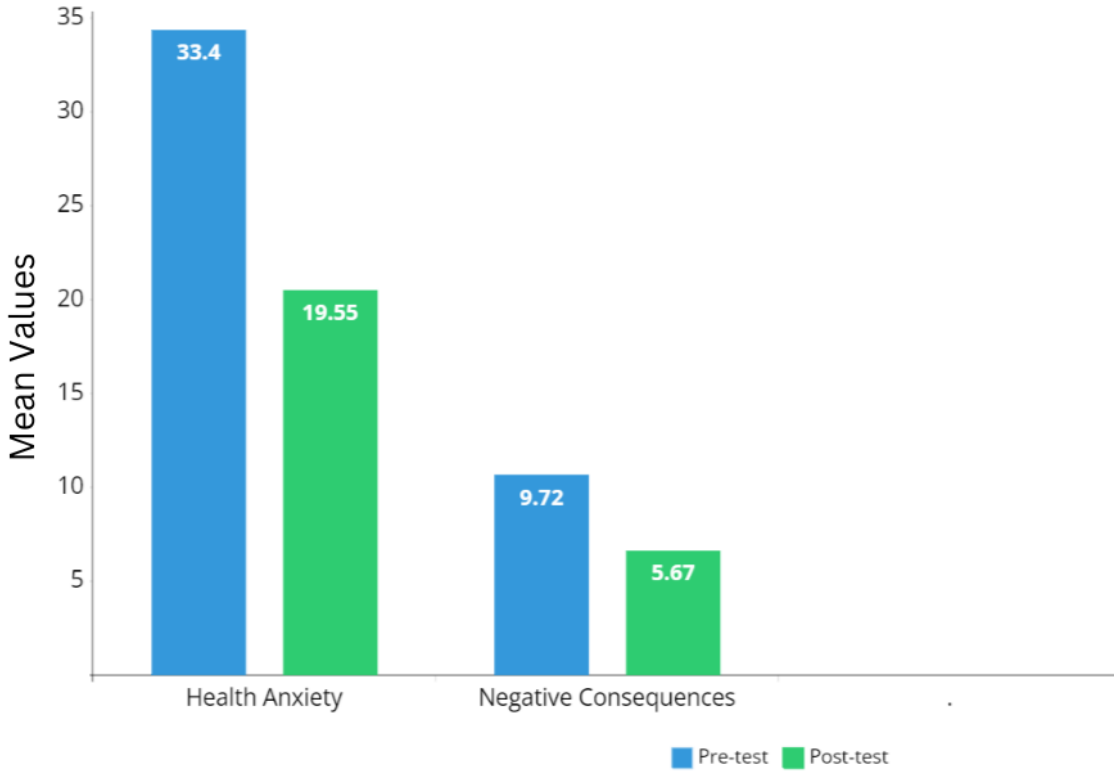


Table: Comparison of the Beck Depression Inventory's pre and post treatment scores for the experimental group (n=40).

Variables	Pre Scores n=40 Mean ±SD	Post Scores n=40 Mean ±SD	t-Values	df	p-Value
Beck Depression Inventory	46.62±2.69	25.65±1.77	62.99	39	0.001

The results of experimental group found significant decrease in the severity of Depressive Symptoms (t-value of 62.99 and $p < 0.001$) between pre and post scores of the patients with Hypocondrical disorder due to application of CBT.

Figure: Comparison of the Beck Depression Inventory's pre and post treatment scores for the experimental group (n=40).

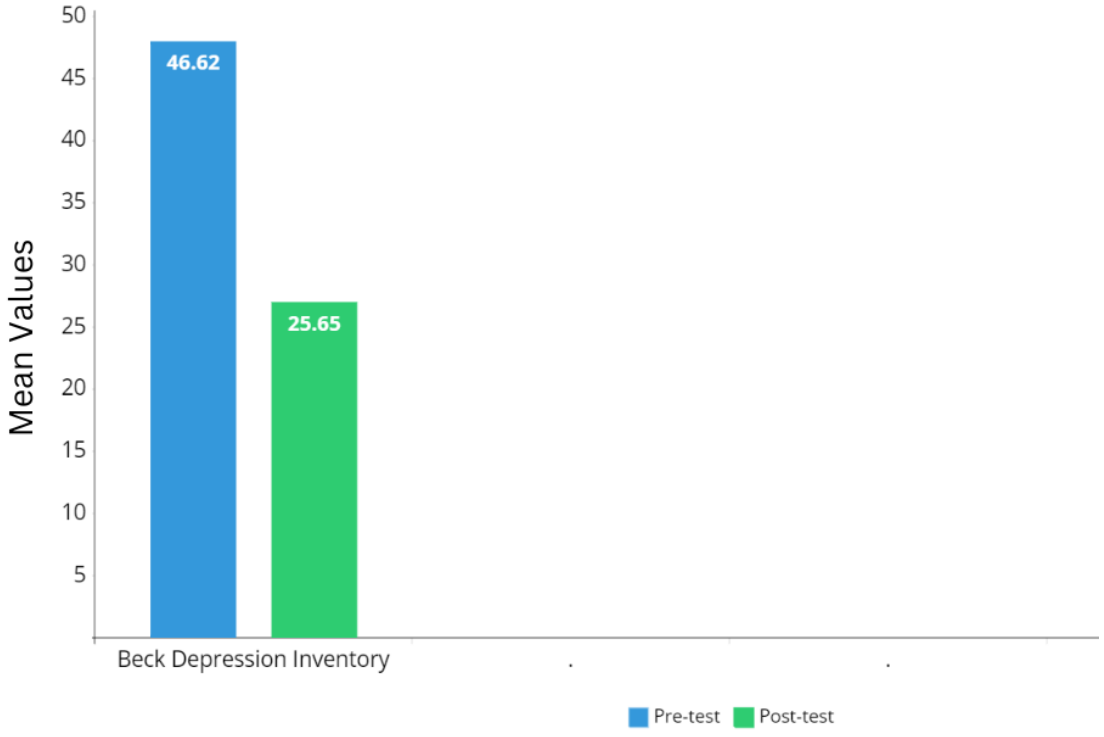


Table: Comparison of the WHO Quality of Life's pre and post treatment scores for the experimental group (n=40).

Variables	Pre Scores n=40 Mean ±SD	Post Scores n=40 Mean ±SD	t-Values	df	p-Value
Physical Health	14.22±2.29	20.70±1.80	-22.78	39	0.001
Psychological	13.70±1.75	17.95±1.79	-18.15	39	0.001
Social Relationship	5.47±1.51	9.35±1.35	-24.70	39	0.001
Environment	16.75±2.74	23.97±2.52	-26.84	39	0.001

The results of experimental group found significant increase in the severity of Physical Health (t-value of -22.78 and $p < 0.001$), Psychological (t-value of -18.15 and $p < 0.001$), Social Relationship (t-value of -24.70 and $p < 0.001$), and Environment (t-value of -26.84 and $p < 0.001$), between pre and post scores of the patients with Hypocondrical disorder due to application of CBT.

Figure: Comparison of the WHO Quality of Life's pre and post treatment scores for the experimental group (n=40).

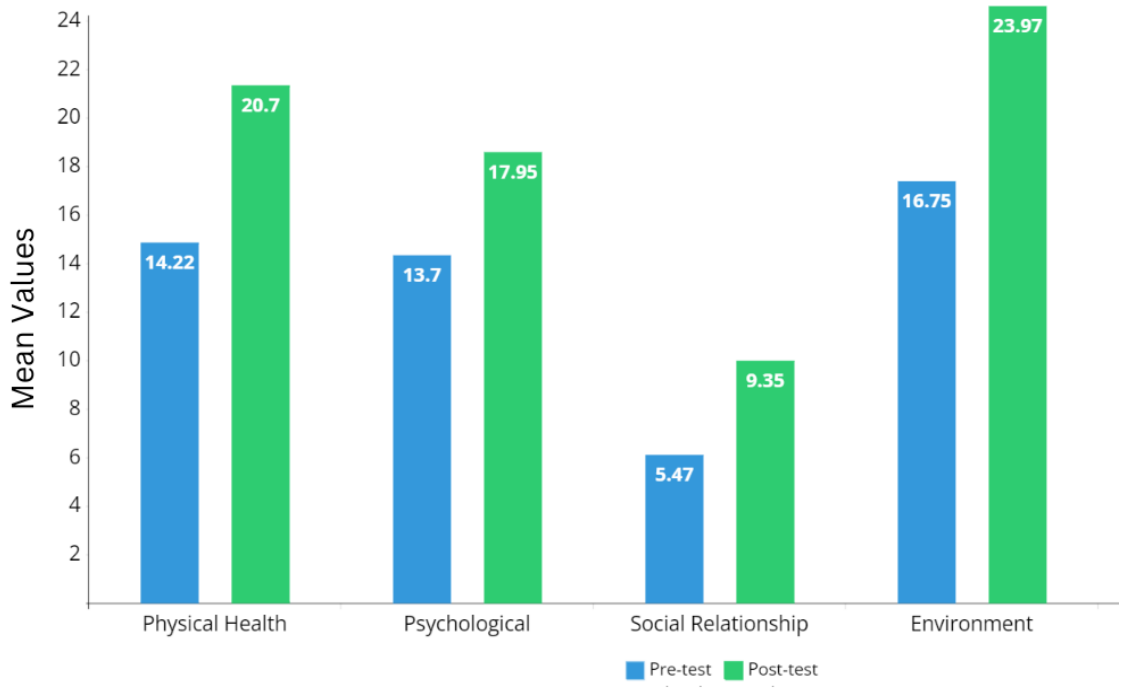


Table: Comparison of the Whiteley Index's (Hypochondriasis) pre and post treatment scores for the control group (n=40).

Variables	Pre Scores n=40	Post Scores n=40	t-Values	df	p-Value
	Mean ±SD	Mean ±SD			
Whiteley Index (Hypochondriasis)	58.37±3.52	58.62±3.99	-0.34	39	0.36

The results of control group found no significant difference in the severity of Whiteley Index (t-value of -0.34 and $p > 0.36$) between pre and post scores of the patients with Hypocondrical disorder

Figure: Comparison of the Whiteley Index's (Hypochondriasis) pre and post treatment scores for the control group (n=40).

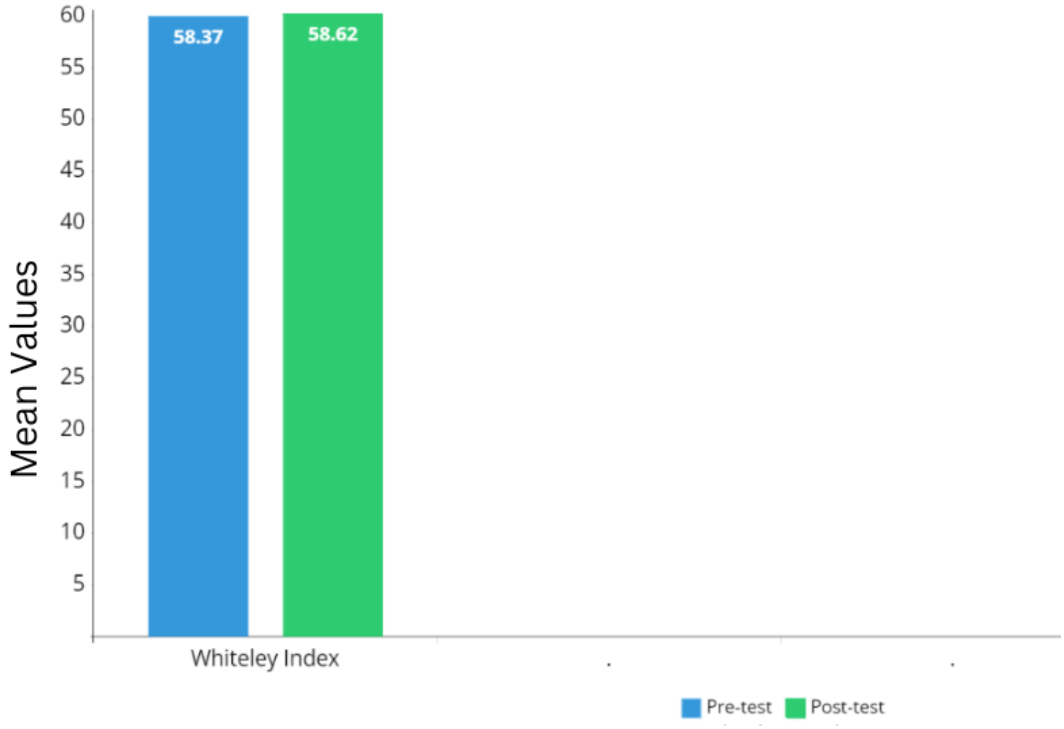


Table: Comparison of the Short Health Anxiety Inventory's pre and post treatment scores for the control group (n=40).

Variables	Pre Scores n=40	Post Scores n=40	t-Values	df	p-Value
	Mean ±SD	Mean ±SD			
Health Anxiety	33.95±2.91	33.80±3.08	.25	39	0.40
Negative Consequences	9.30±1.98	9.70±1.80	-1.02	39	0.15

The results of control group found no significant difference in the severity of Health Anxiety (t-value of 0.25 and $p > 0.40$) and negative consequences (t-value of -1.02 and $p > 0.15$) between pre and post scores of the patients with Hypocondrical disorder

Figure: Comparison of the Short Health Anxiety Inventory's pre and post treatment scores for the control group (n=40).

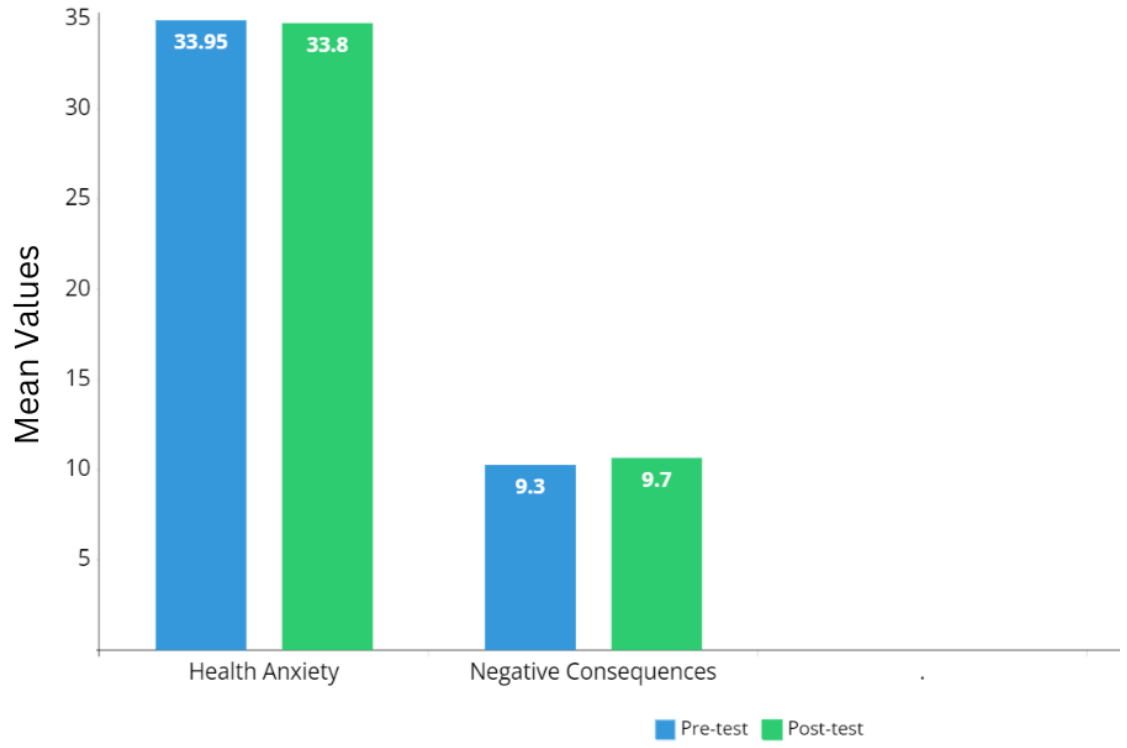


Table: Comparison of the Beck Depression Inventory's pre and post treatment scores for the control group (n=40).

Variables	Pre Scores n=40	Post Scores n=40	t-Values	df	p-Value
	Mean ±SD	Mean ±SD			
Beck Depression Inventory	48.12±5.79	47.55±5.13	0.84	39	0.20

The results of control group found no significant difference in the severity of Depression symptoms (t-value of 0.84 and $p > 0.20$) between pre and post scores of the patients with Hypocondrical disorder

Figure: Comparison of the Beck Depression Inventory's pre and post treatment scores for the control group (n=40).

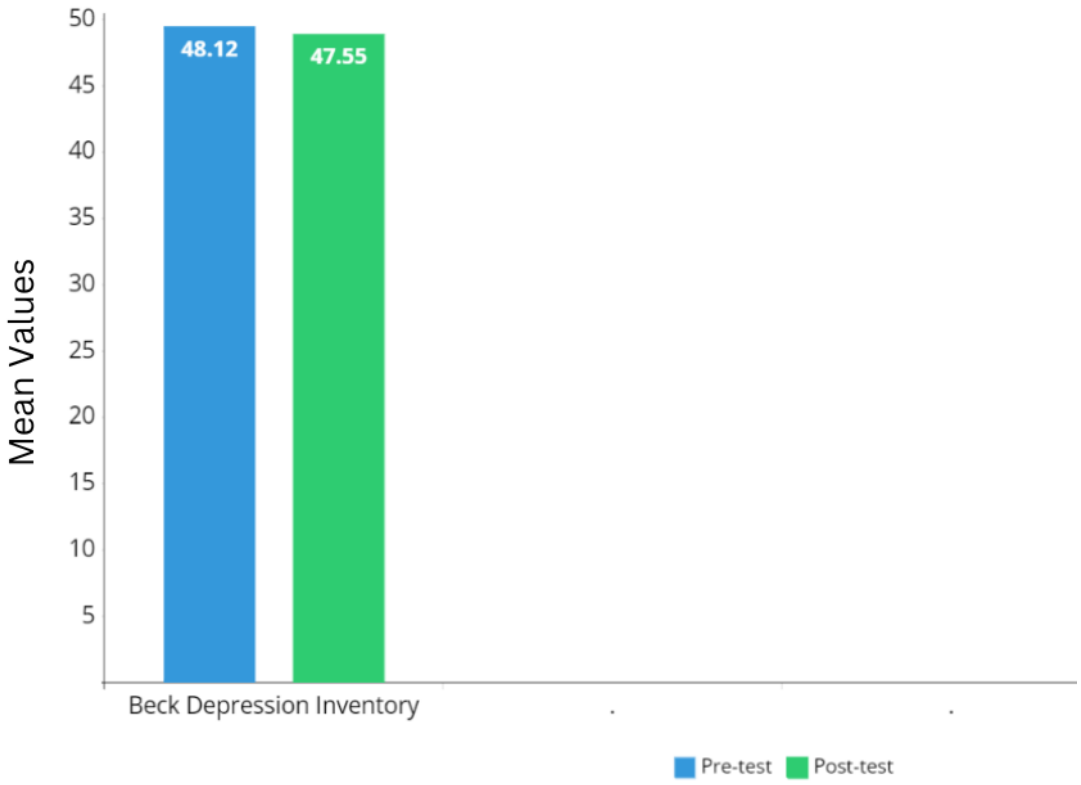


Table: Comparison of WHO Quality of Life's pre and post treatment scores for the control group (n=40).

Variables	Pre Scores n=40	Post Scores n=40	t-Values	df	p-Value
	Mean ±SD	Mean ±SD			
Physical Health	18.17±1.98	18.07±2.09	0.20	39	0.41
Psychological	14.90±3.31	14.82±2.35	0.12	39	0.45
Social Relationship	6.52±1.82	6.47±1.35	0.13	39	0.44
Environment	17.02±3.87	16.75±3.26	0.36	39	0.35

The results of control group found no significant difference in the severity of Physical Health (t-value of 0.20 and $p > 0.41$), Psychological (t-value of 0.12 and $p > 0.45$), Social Relationship (t-

value of 0.13 and $p > 0.44$), and Environment (t-value of 0.36 and $p > 0.35$), between pre and post scores of the patients with Hypocondrical disorder

Figure: Comparison of WHO Quality of Life's pre and post treatment scores for the control group (n=40).

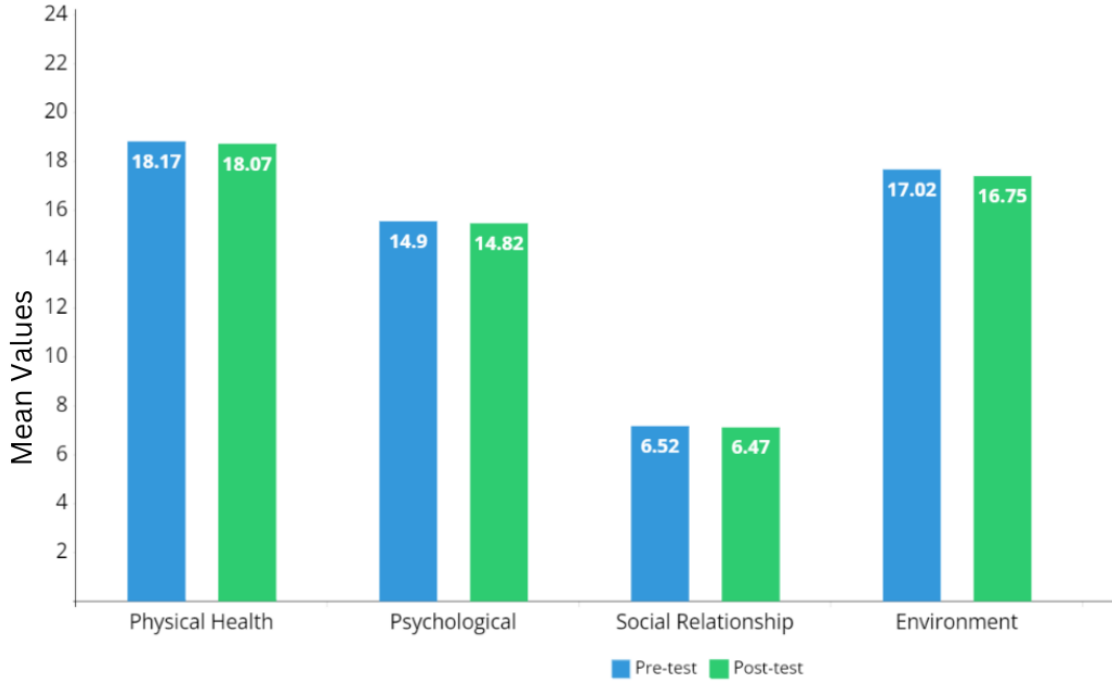


Table: Comparison of the Whiteley Index's (Hypochondriasis) post-treatment scores between the experimental and control groups (N=80).

Variables	Experimental n=80	Control n=80	t-Values	df	p-Value
	Mean ±SD	Mean ±SD			
Whiteley Index (Hypochondriasis)	39.15±2.29	58.62±3.99	-26.75	78	0.001

The results found significant decrease in the severity of Whiteley Index (t-value of -26.75 and $p < 0.001$) post-treatment scores between experimental and control group.

Figure: Comparison of the Whiteley Index's (Hypochondriasis) post-treatment scores between the experimental and control groups (N=80).

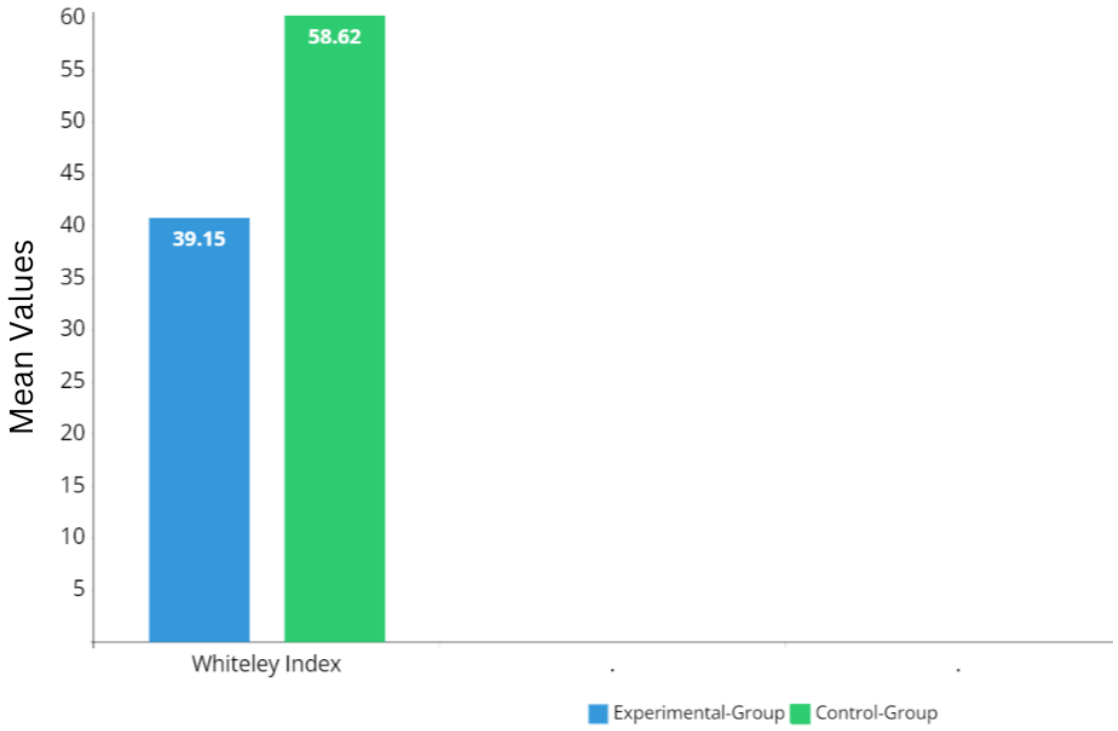


Table: Comparison of the Short Health Anxiety Inventory's post-treatment scores between the experimental and control groups (N=80).

Variables	Experimental n=80	Control n=80	t-Values	df	p-Value
	Mean ±SD	Mean ±SD			
Health Anxiety	19.55±2.43	33.80±3.08	-22.93	78	0.001
Negative Consequences	5.67±1.52	9.70±1.80	-10.78	78	0.001

The results found significant decrease in the severity of Health Anxiety (t-value of -22.93 and $p < 0.001$) and negative consequences (t-value of -10.78 and $p < 0.001$) post-treatment scores between experimental and control group.

Figure: Comparison of the Short Health Anxiety Inventory's post-treatment scores between the experimental and control groups (N=80).

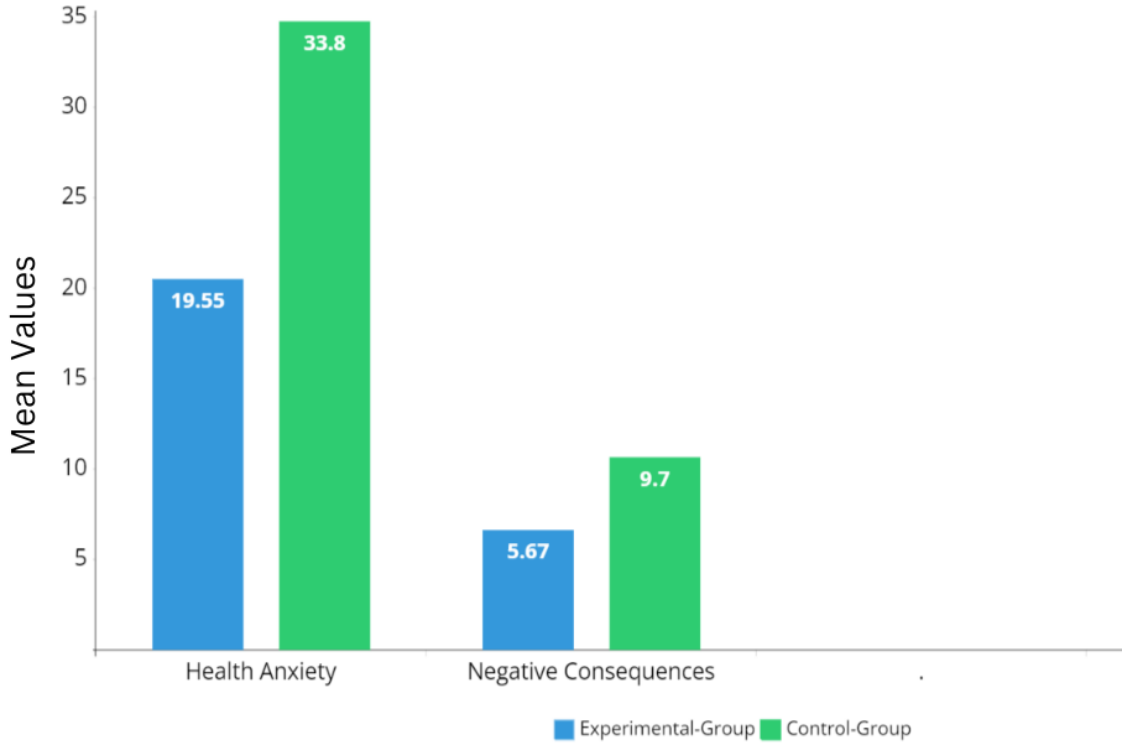


Table: Comparison of the Beck Depression Inventory's post-treatment scores between the experimental and control groups (N=80).

Variables	Experimental n=80	Control n=80	t-Values	df	p-Value
	Mean ±SD	Mean ±SD			
Beck Depression	25.65±1.77	47.55±5.13	-25.47	78	0.001

The results found significant decrease in the severity of Depressive Symptoms (t-value of -25.47 and $p < 0.001$)

post-treatment scores between experimental and control group.

Figure: Comparison of the Beck Depression Inventory's post-treatment scores between the experimental and control groups (N=80).

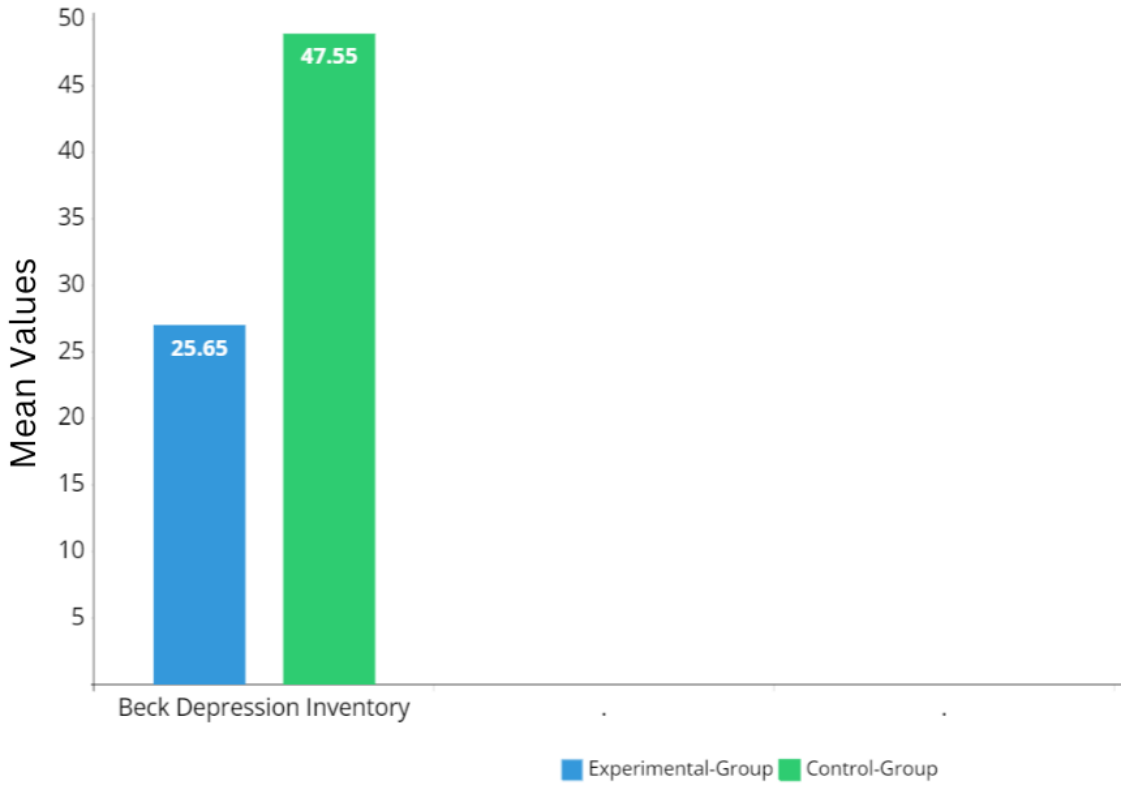
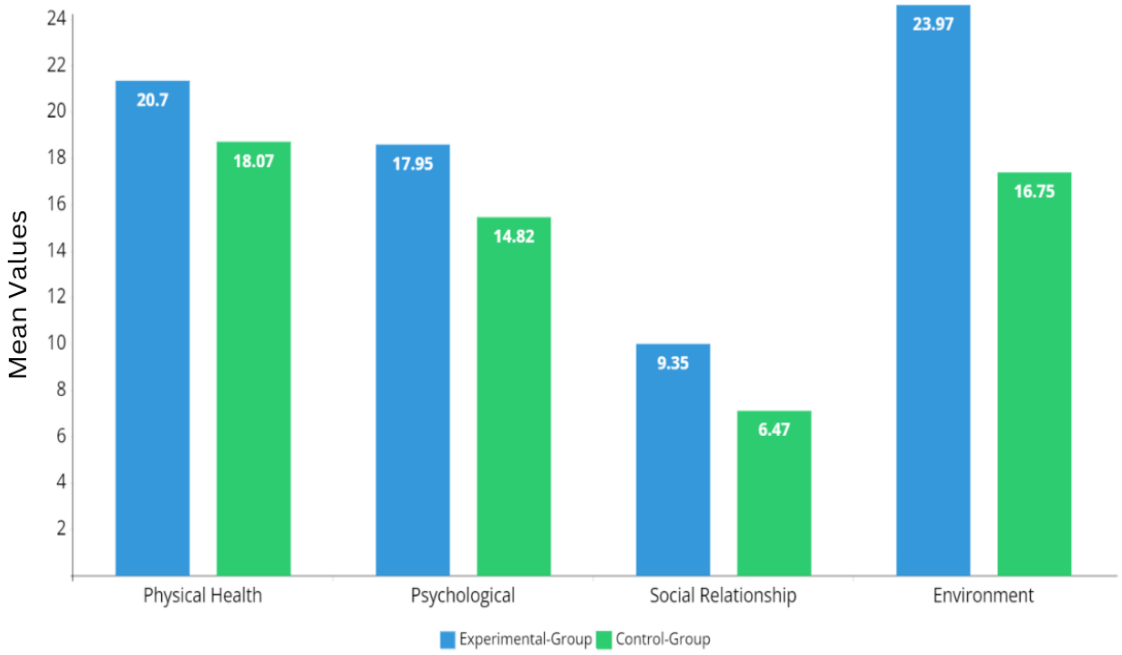


Table: Comparison of the WHO Quality of Life's post-treatment scores between the experimental and control groups (N=80).

Variables	Experimental n=80 Mean ±SD	Control n=80 Mean ±SD	t-Values	df	p-Value
Physical Health	20.70±1.80	18.07±2.09	6.01	78	0.001
Psychological	17.95±1.79	14.82±2.35	6.67	78	0.001
Social Relationship	9.35±1.35	6.47±1.35	9.49	78	0.001
Environment	23.97±2.52	16.75±3.26	11.07	78	0.001

The results found significant increase in the severity of Physical Health (t-value of 6.01 and $p < 0.001$), Psychological (t-value of 6.67 and $p < 0.001$), Social Relationship (t-value of 9.49 and $p < 0.001$) and Environment (t-value of 11.07 and $p < 0.001$), post-treatment scores between experimental and control group.

Figure: Comparison of the WHO Quality of Life's post-treatment scores between the experimental and control groups (N=80).



In conclusion, the experimental group showed significantly better outcomes in the severity across all measures compared to the control group. This indicates that the CBT intervention was highly effective in reducing hypochondriacal fears, beliefs, health anxiety, and depressive symptoms, while also improving overall quality of life in physical, psychological, social, and environmental domains.

Discussion

The present study demonstrates the efficacy of Cognitive Behavioral Therapy (CBT) in significantly reducing symptoms associated with Illness Anxiety Disorder (IAD), as measured by reductions in Whiteley Index scores, health anxiety, depressive symptoms on the Beck Depression Inventory, and improvements in Quality of Life scores across physical, psychological, social, and environmental domains. The findings align with existing literature supporting CBT as a preferred intervention for IAD and related health anxiety (Hedman et al., 2014; Newby et al., 2015). These results highlight CBT's impact on modifying maladaptive cognitive and behavioral patterns that maintain health anxiety, improving overall mental health and well-being.

One key finding of this study was the reduction in Whiteley Index scores, indicating a significant decrease in hypochondriacal beliefs. The Whiteley Index, commonly used in studies on health anxiety, measures the intensity of fears and beliefs about having a serious illness. Previous studies have shown that CBT is effective in challenging these cognitive distortions and reducing the catastrophic interpretations of bodily symptoms that characterize IAD (Abramowitz et al., 2002; Salkovskis & Warwick, 1986). Through cognitive restructuring and exposure techniques, patients in the current study learned to reframe irrational beliefs and faced their health-related fears without excessive reassurance-seeking or symptom-checking behaviors, both of which perpetuate IAD symptoms. This finding reinforces the value of CBT as an intervention capable of altering deeply ingrained health anxieties in IAD patients.

Additionally, the intervention's impact on health anxiety was noteworthy. Patients receiving CBT showed significant decreases in overall health anxiety, which aligns with the efficacy reported in prior studies (Salkovskis et al., 2003; Tyrer et al., 2011). Health anxiety, a core component of IAD, is exacerbated by attentional biases towards bodily sensations and catastrophic misinterpretations. CBT's structured approach addresses these biases by helping patients disengage from hypervigilant monitoring of bodily sensations and redirect attention toward more adaptive coping strategies. This mechanism, central to cognitive-behavioral models of health anxiety, has shown to effectively reduce excessive health-related fears and improve coping strategies, as was evident in our findings.

The reduction in depressive symptoms observed in this study, as indicated by scores on the Beck Depression Inventory, also speaks to the broader impact of CBT. Depression often co-occurs with IAD, as health-related fears lead to feelings of helplessness and social withdrawal (Newby et al., 2015). The therapeutic techniques in CBT not only address health-related cognitions but also include behavioral activation and problem-solving skills that target depressive symptoms. The results of this study align with previous meta-analyses suggesting that CBT effectively reduces depressive symptoms in patients with anxiety-related disorders, including IAD (Hoffman et al., 2012).

The improvement in Quality of Life scores across multiple domains further validates the efficacy of CBT for IAD. Patients in the experimental group reported better physical, psychological, social,

and environmental well-being after the intervention, indicating that CBT addresses not only the symptomatic aspects of IAD but also improves functional aspects of patients' lives (Salkovskis & Warwick, 1986). Quality of Life improvements may result from increased engagement in social activities, reduced health-related restrictions, and enhanced self-efficacy in managing symptoms. Prior research has emphasized that reducing health anxiety can positively impact various life areas, as anxiety about illness often leads to social isolation, avoidance behaviors, and reduced physical activity (Hedman et al., 2014).

Conclusion:

The present findings provide further evidence for the effectiveness of CBT in reducing the core symptoms of IAD, including health anxiety, hypochondriacal beliefs, and depressive symptoms, while also enhancing quality of life. These results underscore CBT's utility as a comprehensive, multidimensional intervention for IAD, addressing the complex interplay of cognitive, emotional, and functional impairments associated with the disorder. Future research may benefit from expanding sample sizes and examining long-term effects to better understand CBT's sustainability and impact across diverse patient populations.

LIMITATIONS AND FURTHER RECOMMENDATIONS

This study was conducted at a single center, potentially limiting the generalizability of its findings to the broader medical population. Additionally, as it took place in a tertiary care hospital, the sample likely included patients with more severe health issues. Future studies should aim for a larger sample size and involve multiple sites, including primary, secondary, and tertiary care settings, to enhance the applicability of the results across diverse medical populations.

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