

## Health Coaching Effectiveness in Controlling Idiopathic Intracranial Hypertension

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### Abstract

**Background:** Idiopathic intracranial hypertension is a challenging serious disease with significant burden on individuals and society. It's increasing incidence with the obesity epidemic increasing blindness risk which more press on service capacity. **Aim:** To examine the health coaching effectiveness in controlling idiopathic intracranial hypertension. **Subjects and Method: Subjects:** A purposive sample of 45 patients fulfill the inclusion criteria were selected. **Setting:** Medical & Surgical neurology and Ophthalmology outpatients' clinics at two University and Al-Qasr Teaching Hospitals. **Design:** Quasi-experimental research design allowed for accomplishment of study goal. **Tools:** four tools were utilized included, patients' biodemographic questionnaire, headache diary assessment questionnaire, disease related objective and subjective assessment questionnaire and disease related health coaching practices questionnaire. **Results:** Patients' weight preintervention was 84 Kg which reduced to 73 Kg and 65 Kg after three and six months respectively. Serum potassium level elevated from 3.6 to 4.4 after three and six months respectively. Also, systolic and diastolic blood pressure, headache attacks and analgesic use per week were significantly decreased after three and six months of intervention. Eye related disorders as blurred vision; papilledema degree was significantly decreased after intervention by three and six months. **Conclusion:** The nursing health coaching program application has proven potent effectiveness on patients' intracranial pressure reduction reflected on patients' little headache attacks per week, decreased disease related signs and symptom's severity and frequencies, resolved papilledema with improved visual function. **Recommendations:** Nursing health coaching program should be applied among all patients with idiopathic intracranial hypertension as an effective non-pharmacological, non-surgical conventional method.

**Keywords:** Idiopathic intracranial hypertension, Health coaching

### Introduction

A condition known as idiopathic intracranial hypertension (IIH) is marked by a persistently high intracranial pressure (ICP) that is linked to a dysregulation of the dynamics of the cerebro-spinal fluid

(CSF) and venous sinus pressure. There is a definite rise toward obese women in reproductive age. In conjunction with the global obesity pandemic, its prevalence in the population is rising. The current prevalence among obese women is 20 per

100,000, and it is expected to continue to rise (**Tham & Suh, 2022**).

Every domain of the patient's quality of life is significantly impacted by IIH. The most notable physical findings are bilateral disc edema, pulsatile synchronous tinnitus, nonspecific headaches that vary in type, location, and frequency, subjective visual loss, and transient visual obscurations, which present as a graying out of vision that lasts for a few seconds and are typically related to orthostatic movements and horizontal diplopia. Asymmetric papilledema, in which one optic nerve is more or less edematous than the other, or no papilledema at all, can be seen in rare patients who have the usual signs of elevated intracranial pressure (**Wang et al., 2022**).

In order to rule out secondary or emergent causes of raised ICP, such as tumor, infection, hydrocephalus, or venous thrombosis, and to identify any indirect indications of IIH resulting from elevated ICP, all patients with bilateral optic nerve edema should have urgent neuroimaging. A lumbar puncture (LP) is done to confirm an increased ICP and assess the contents of the CSF (description of the fluid, analysis of the protein, glucose, blood cell type/count, and culture) once secondary or emergent causes have been ruled out. Neuroimaging should always come first, never an LP. Combining magnetic resonance imaging (MRI) and magnetic resonance venography (MRV) for brain imaging is the recommended neuroimaging technique (**Sarrami et al., 2022**).

Since the term "nursing health coaching" is becoming more widely used worldwide, patients' groups need to embrace the idea of nursing health coaching more than they would a health education lecture. A nursing health coaching approach that

emphasizes the planning and implementation of all factors influencing a patient's health and illness in order to enable patients to maintain and develop their own personal health and wellness, as well as to appropriately accept and use the health and medical services that are available, whether the environment, patient knowledge, attitudes, and behavior in things pertaining to health. Patients will be assisted in reaching their objectives by an established nursing IIH-related theoretical and practical body with particular health-related subjects and, as a result, patients' motivational support (**Heider et al., 2023**).

Due to the lack of data supporting IIH therapeutic approaches and the strong correlation with obesity (over 93%), losing weight is frequently recommended as a therapy along with objective assessments of papilledema and visual function, headache ratings, and—most importantly—alterations in ICP. The main objectives of therapy are to avoid irreversible visual loss and to alleviate symptoms. The IIH treatment offers class I evidence in support of acetazolamide with weight reduction therapy. Venous sinus stenting, CSF diversion, and optic nerve sheath fenestration have all been effectively used in medically refractory or fulminant patients (**Wang et al., 2022**).

The primary goals of IIH nursing care are to reduce body weight, elevate the head and trunk, refrain from doing the Valsalva maneuver (VM), regulate blood pressure, take medicine as prescribed, and limit side effects. As putting IIH into remission needed up to 15% of weight loss, all patients with a BMI more than 30 kg/m<sup>2</sup> should get weight management counseling as soon as possible. In the event that patients are unable to lose weight on their

own, getting expert assistance with a regimented diet would be the first step. Furthermore, in cases of severe hypertension ( $> 180/95$  mm Hg), blood pressure management becomes essential because MAP must be high enough to sustain cerebral perfusion pressure (CPP) in the face of ICP rises. Oppositely hypotension also should be monitored to prevent cerebral hypoperfusion (Maiese, 2019).

Furthermore, Valsalva maneuver is to be avoided since it causes a quick evacuation of blood from the thoracic to the carotid arteries, raising the intracranial pressure and changing brain perfusion. The spinal cord receives additional transmissions of the changed pressures. Heavy lifting, vomiting, coughing, sneezing, compressive trauma, childbirth, intense sexual activity, and straining on the toilet are typically associated with these maneuvers. Furthermore, as long as a safe CPP of at least 70 to 80 mmHg is maintained, head and trunk elevation up to 30 degrees is helpful in lowering ICP in the majority of patients with intracranial hypertension. It is recommended to nurse flat patients with poor hemodynamic circumstances. Thus, while evaluating and monitoring head elevation in patients with elevated ICP, CPP is the most crucial component (Smith & Amin-Hanjani, 2019).

#### Significance

IIH is a difficult and dangerous illness that has a big impact on both the person with it and society as a whole. Obese women between the ages of 15 and 44 (4 to 21 / 100,000) had a greater frequency of IIH cases; these women account for 90% of all cases. According to estimates, this incidence has more than quadrupled during the past 30 years in tandem with an increase in obesity rates. Adolescent

females who have a body mass index (BMI) in the obese range are more vulnerable; their incidence might be up to 20 times higher than the overall population. The incidence of IIH has grown due to rising obesity rates worldwide (by more than 350% in the previous ten years) (Mollanb et al., 2021). Both the etiology and the preventative measures for IIH are unknown. Preventing additional vision loss and concomitant symptoms, such as headache, in individuals diagnosed with IIH is the aim. In addition to diet and lifestyle changes aimed at losing weight, medical and surgical intervention can stop the progression of IIH. Permanent vision loss brought on by inadequate and partially ineffective standard care is the disease's primary importance (Andrew & Michael, 2023).

This study will examine the incorporating six-month nursing health coaching, attending regular medical check-ups and monitoring-guided weight reduction, blood pressure, Valsalva maneuver, medication compliance and management of its side effects, which will differ from other studies mostly by a longer duration and a higher intensity of support contact. So the aim of this study was to examine the health coaching effectiveness in controlling idiopathic intracranial hypertension.

#### The Aim

To examine the health coaching effectiveness in controlling idiopathic intracranial hypertension.

#### Hypotheses:

1. Patients will exhibit reduction in weight with intracranial pressure (as evidenced by papilledema reduction), systolic and diastolic blood pressure after health coaching application than pre.

2. Patients will exhibit more balanced Potassium level with Acetazolamide medication intake after health coaching application than pre.
3. Patients will exhibit improved total health coaching practice's score than pre intervention.
4. Patients will exhibit little headache attacks/ week and analgesic use / week after health coaching application than pre.
5. Patients will exhibit resolved papilledema with improved visual function after health coaching application than pre.
6. Patients will exhibit little disease related signs and symptom's severity and frequencies after health coaching application than pre.

#### Subjects and Method

##### **Design :**

Quasi-experimental design (one group pre-and post (one and two) test).

##### **Setting:**

Medical & Surgical neurology and Ophthalmology outpatients' clinics at University and Al-Qasr Teaching Hospitals.

##### **Subjects:**

A purposive sample of 45 patients with the following inclusion criteria was selected:

- Adults of both genders.
- BMI > 30 kg/m<sup>2</sup>.
- Intracranial pressure >25 cm H<sub>2</sub>O with normal MRI & MRV findings.

##### **Exclusion criteria**

- Secondary IHH whether related to disease as internal jugular obstruction or medications as Vit A and hormonal therapy.
- Anemia because they can't tolerate weight reduction.
- Patient with ventriculoperitoneal and lumbo-peritoneal shunts.

##### **Sample size estimation**

According to Matera et al, 2017 who revealed that after implementing health coaching program to control blood pressure, systolic blood pressure was 157.6±13.12 in base line assessment and 136.58±10.65 in post assessment. At a power 95%, alpha error 0.05 and 95% confidence interval, the sample size was estimated according to the following formula:

$$N = (Z_{\alpha-1} + Z_{1-\beta})^2 * \sigma^2 / d^2$$

N = estimated sample size

Z<sub>α-1</sub> = the factor related to confidence interval (1.96 for alpha error 0.05)

Z<sub>1-β</sub> = the factor related to the power of the study

σ = standard deviation difference

d= mean difference

The estimated sample size was 37 cases, after adding 8 cases to overcome the suspected loss from follow up, the total sample was 45 cases.

#### **Tools: Four tools were used to conduct this study**

##### **Tool I: Patients' biodemographic questionnaire**

It was developed by researchers to assess patients' sociodemographic and medical data. It included the following Patients' sociodemographic data: it included age, sex, and occupation.

##### **Patients' medical data:**

A- Disease related data: It included disease onset, number of lumbar puncture and associated comorbidities.

B- Physiological measurements: BMI

Lab measurements: ketonuria and serum potassium level.

##### **Tool II: Headache diary assessment questionnaire:**

A short-form survey divided into four parts, the first two parts were developed by researchers according to criteria from the International Headache Society after

reviewing the recent related relevant literature (Sarrami et al., (2022)).

**Part one:** Headache attacks frequency: It used to measure attacks frequencies all over the days for a week.

**Part two:** Analgesic usage: It used to measure the frequencies of different analgesic used all over the days for a week.

**Part three:** Visual analogue scale (0-10): It was developed by Gould et al., (2001) and was adopted by researcher and translated into Arabic to evaluate headache severity.

**Part four:** Headache impact test (HIT): It was adopted from Kosinski et al. (2003) to assess the headache nature and what cannot be done because of headaches. It consists of 6 questions.

**Scoring system of headache impact test:**

Each variable was on a five-point Likert scale. From never, rarely, sometimes, very often and always. To score, add points for answers in each severity rating, never take 6 points score, rarely 8 points score, sometimes 10 points score, very often 11 points score and always 13 points. Responses were computed to obtain the total mean scores.

**Tool III: Disease related objective and subjective assessment questionnaire**

It was developed to assess visual and other symptoms severity & frequency. It included

- Papilledema rating scale: This scale was developed by Frisen, 1982 and adopted by the researcher and translated into Arabic to evaluate papilledema degree which ranging from 1 to 4 (the latter is most severe).

- Optic disc elevation, Retinal nerve fiber layer distension, nerve sheath diameter & blurring vision: evaluated by Ophthalmologist.

-Other symptoms: included pulsatile tinnitus, back pain, neck pain, dizziness, cognitive disturbance and radicular pain.

Tool IV: Disease related health coaching practices questionnaire

It was developed by researchers after extensive recent relevant literature review (Toscano et al., 2021), it included three main parts:

**Part one:** Weight reduction practice coaching: Adopted from National Heart, Lung, and Blood Institute (NHLBI, 2000) to limit total calories that consumed by patients to 1750 kJ/day (425 kcal/day) for weight loss achievement.

**Part two:** Hypertension and intracranial hypertension reduction practices coaching.

Part three: Disease related medications' side effects and complications prevention practices coaching.

Scoring system this include three main topics, each one has 2 score. If patient's response was completely correct (good), or score 2, If patient's response was incompletely correct (average), or zero. If patient's response was wrong / don't know (poor). Total score ranged from zero to 6 (0-2 poor, 3-4 average and 5-6 good score).

**Tools' validity and reliability :**

**Validity:**

Five experts in the field of Medical & surgical neurology, medical surgical Nursing and family and community health nursing at the Faculty of Medicine and Nursing, Menoufia University tested the instruments' face and content validity. Tools were assessed for clarity, accuracy, relevance, competency and completeness and their recommended modifications were taken into consideration.

**Reliability:**

The reliability of four tools was examined using Cronbach's co-efficiency alpha to find out the extent to which the

instruments' elements were related to one another. The estimated tool's reliability was 0.93, 0.89, 0.92, and 0.85 respectively. As a result, it was highly reliable to conclude the tools.

Ethical considerations:

-Formal approval Number 1007 on 20-9-2023 was taken from the Research Ethics Committee of the Faculty of Nursing at Menoufia University.

-An official permission was obtained from the authorities of Medical & Surgical neurology and Ophthalmology outpatients' clinics after explaining the purpose of the study and method of data collection.

-Written informed consent was obtained after clear explanation from patients to participate in this study was obtained after explaining the purpose of study, patients reassured about their information confidentiality which only for the study purpose.

-Researchers stresses patients' entirely voluntary and anonymity through coding data &/ refusal to participate would not affect their care.

Pilot study: Prior to data collection, a pilot study was done on 5 patients (11%) to assess the usability and clarity of tools and patients in the pilot study were excluded.

#### **Data collection:**

-Data collection started from October 2023, to November, 2024. Patients who met the study inclusion criteria were selected.

#### **Assessments phase**

-The patient's database was collected using all structured tools which included patients' bio demographic questionnaire, headache diary assessment questionnaire, disease related objective and subjective assessment questionnaire and disease related health coaching practices questionnaire.

-Patients were interviewed in Medical & Surgical neurology and Ophthalmology outpatients' clinics at University and Al-Qasr Teaching Hospital. The researchers represented in the hospital five days / week for about 6 months to collect the patients matching the inclusion criteria.

-Baseline data was collected by the researchers in the first interview and lasted between 35 to 45 minutes.

-Each patient underwent bio-physiological measurements by measuring body weight and height to calculate the body mass index. Also, urine analysis for ketone bodies and blood analysis for potassium level were measured.

-Measuring blood pressure while the patient in sitting position and blood pressure apparatus at the heart level.

-Intracranial pressure was measured through lumbar puncture by anesthesiologist after doctor order. Visual function evaluated by Ophthalmologist include papilledema degree, optic disc elevation and nerve sheath diameter, optical coherence tomography measurement of retinal nerve fiber layer, visual loss, diplopia and visual obscurations. Other disease related symptoms as tinnitus, and headache also were assessed together with medication used.

#### **Planning phase**

-After patient's assessment, the designed low caloric diet was prepared and introduced to each patient under researchers' supervision according to protocol of interventions. This protocol explained by details in the first session of intervention. Brochure, pamphlet and power point presentation was prepared for patients as a guide for all relevant information related to interventions.

-All IHH related health coaching practices as weight reduction practices, hypertension and ICP reduction practices, medications' side effects and complications prevention practices were explained and supplemented with guided colored pamphlet with clarifying pictures.

-The researchers take permission from the director of outpatients' clinics to allocate special room supplied with data show served as patients allocated for conducting the sessions.

### **Implementation phase:**

#### **-First coaching topic**

-Weight reduction practice program which conducted within 2 stage for 6 months, the stage 1 for the three months, and then for another 3 months. Weight loss was achieved by providing patients with a total of 1750 kJ/day (425 kcal/day) according to National Heart, Lung, and Blood Institute (NHLBI, 2000). Patients were advised to consume 1) Protein: Keeps the body full for longer so choose lean poultry (chicken or turkey breast), fish, beans or pulses. 2)Vegetables: A great source of vitamins and fiber with low in calories so eat lots of vegetables with each meal. 3) Healthy fats: Keeps fuller for longer as avocados and full fat Greek yogurt. 4) Complex carbohydrates: Take the body longer to break down and convert into energy as whole grains, potatoes, sweet potatoes, beans and lentils.5) Low sodium diet: prevent fluid retention in the body so read all canned to identify Na %, limit table salts.

-No additional food, drink at least 2 liters of fluid a day and green tea. increase potassium rich food like banana, dates and potatoes.

-Don't skip breakfast, eat three healthy balanced meals / day with two snacks, eat within hungry and stop eating within full,

eat slowly and steadily, choose healthy snacks such as fruit, vegetables or small portions of unsalted nuts.

-Do not weigh yourself every day as it is normal to fluctuate and this can be disheartening.

-Try to exercise for an hour at least three times / week.

-Lack of sleep causing unhealthy food choices and raise body's stress hormone (cortisol) which causes weight gain, so for at least 7 hours of sleep / night.

-During stage 2 all patients underwent weekly follow up by telephone to ensure compliance with the diet through evaluation of weight lost and presence of urinary ketones (a feature of abstaining from food intake).

-Patients were also regularly encouraged, through the provision of weekly nutritional counseling.

-Create a customizable 1750 calories diet meal plan, it is personalized meal plans based on patient food preference, budget, and schedule. Each patient diet and nutritional goals with calories calculator weekly meal plans, grocery lists and give examples weekly.

#### **-Second coaching topic**

-ICP reduction coaching practice through patients' compliance with the following :

-On sleeping keep the head with trunk elevated but not greater than 30 degrees to maintain cerebral tissue perfusion.

-ICP is higher during sleep than during periods of awake lying supine.

-Continuously maintain the neck in neutral position.

-Continuously keep body temperature within normal thorough avoidance or even early detection and proper management of infection, heat stroke.

-Preventing body fluid volume excess through low sodium intake ( $\leq 2$  g / day) ,

avoid excessive fluid intake and maintain fluid and electrolyte balance.

-Blood pressure (BP) monitoring coaching practice through

-Comply with the recommended low fat and sodium intake ( $\leq 30\%$  unsaturated fat, take healthy fat found in nuts and natural oils and  $\leq 2$  g / day).

-Exercise daily or increase the activity level for example, walking for 30 to 45 minutes / day increase home physical activities and limit sitting time.

-Losing weight; loss of 5% - 10 % of body weight may lead to the termination of this disorder and significantly diminishes the risk of its recurrence about 0.5 to one kilogram per week.

-Limiting alcohol, stop smoking through behavioral modification and increase awareness about its danger on health status and its relation with the progression of disease.

-Get enough (7 - 9) sleep hours / daily.

3-Managing Valsalva maneuvers coaching practice: Because VM resulting from lifting heavy things, vomiting, coughing, extra physical exertion, straining with toilet, sneezing, compressive trauma, labor, vigorous sexual activity and hip flexion. Researchers coaching patients a variety of mechanisms including a reduction in airway and intrathoracic pressure with facilitation of cerebral venous outflow as breathe out, contract the pelvic floor muscles (PFM) while stand up, lift properly with inward contraction of abdominals and outward breath on effort and pull or push instead of lifting.

-**Third coaching** was about the disease related medications' side effects prevention practice.

-Acetazolamide: It is the first-line therapy acting as an effective agent for lowering ICP and prescribed for all patients with

IIH. It is an inhibitor of carbonic anhydrase that works to stop the breakdown of carbonic acid, which leads to a buildup of the acid. This first-line medication usually reduces ICP symptoms in the majority of patients, most notably headaches. The recommended starting dose of acetazolamide is 0.5–1 g/day. The majority of people react to 1-2 g/day of medication. This can be raised to 3–4 g/day, however many patients find that the high dosage causes unpleasant side effects that include paresthesia, exhaustion, a metallic taste in carbonated drinks, vomiting, diarrhea, nausea, and diminished libido.

-Diuretic: Increase urinary sodium, potassium, and water losses by reducing salt reabsorption at various nephron sites. Thus, patients were presented to therapeutic intervention to prevent heart affection, fluid and electrolyte imbalances, and/or acid-base problems.

-Headache: Individuals with stable visual function but insufficient relief from headaches after receiving first-line pressure-lowering medication may be assessed for primary headache prevention. These headaches can often be treated with propranolol, amitriptyline, and other commonly used preventative drugs for migraines. Topiramate is an excellent choice as well since it reduces weight, a side effect that may aid in the illness's remission.

-Corticosteroids: In patients with severe papilledema, these drugs are infrequently used as an adjuvant to acetazolamide to speed up recovery. It shouldn't be regarded as a long-term remedy due to its severe negative consequences. Furthermore, there's a chance that the ICP will recover when the amount of corticosteroids is lowered.



-Each patient was followed up by phone calls for ensuring that they follow the instructions as illustrated by the researchers and remembering them, the patients who followed and complied with the program were highly motivated when seeing improvements in their investigation and measurements

-Session took from 60 to 90 minutes were designed. A group of what's app was formulated by the researcher for replying patients' questions, follow patients' compliance with diet practices, and time for assessment. Patients who followed and complied with the program were highly motivated when seeing improvements in their investigation and measurements.

#### **Evaluation phase:**

-All data were assessed for each patient through the scheduling of meetings after three month (posttest one) on the same follow-up day for first time assessment and reassessment after six months (posttest 2) (The minimum allowed time for program results to be reflected on patient outcomes for evaluation) as a follow-up.

#### **Statistical analysis:**

Data were transferred to a personal computer, classified, and analyzed using SPSS (version 20, SPSS Inc., Illinois, Chicago, USA). The quantitative data was described as mean, standard deviation and range while qualitative data was described as number and percentage. Paired t- test and Wilcoxon Signed rank test were used to compare quantitative data with normally distributed and not normally distributed respectively in comparison between pretest and posttest measures. Mc-Nemar Chi square test was the test of qualitative data comparison between pretest and posttest measures. Spearman correlation test was used to test correlation between weight reduction and other parameters. P-value

<0.05 was considered statistically significant.

#### **Results**

**Table (1):** Among 45 studied patients the mean age was 33 years and ranged from 20 - 50 years, 84.4% of them were females, 62.2% of them performed Valsalva maneuver during work, regarding duration of disease, 40% was in the first month of disease and 33.3% had disease since less than 4 months. DM, HTN and atherosclerosis were comorbidities presented among 33.3%, 42.2% and 28.9% respectively, majority of the studied group (73.3%) were subjected to lumber puncture for 3 times .

**Table (2):** Shows that, after health coaching program, weight reduction practice and its benefits was significantly improved from 13.3% of good level pre intervention to 100% after three and six months. Also, HTN & ICP reduction practices, improved from 80% fair level to 86.7% and 100% good level after three and six months respectively. Moreover, disease related medications' side effects and complications prevention practice, was 66.7% poor level pre intervention but it increased to 86.7% average level after three then 86.7% good level after six months with high statistically significant differences ( $P < 0.001$ ).

**Figure (1):** Reveals that, preintervention there is poor total practice level among two thirds (66.7%) of studied patients which promoted to good level among the majority (100% and 86.7%) of them after health coaching program by three and six months respectively.

**Table (3):** Illustrates that the mean weight preintervention was 84 Kg which reduced to 73 Kg the 65 Kg after three and six months respectively. Systolic and diastolic blood pressure, were significantly

decreased after three months and continue decreasing significantly after six months. Oppositely mean serum potassium level continues to elevate from 3.6 to 4.4 after three and six months with statistically significant difference.

**Figure (2):** Clarify that the mean weight reduction in first post assessment (after three months) was  $13.15 \pm 2.5$  then elevated to  $22.46 \pm 3.40$  in second post assessment (after six months).

**Figure (3):** Presents that headache attacks per week and analgesic use per week were significantly decreased after health coaching program by three and six months with significant different between first and second post assessment.

**Table (4):** Reveals that eye related disorders including blurring of vision, degree of papilledema, optic disc elevation, optic nerve sheath diameter and retinal nerve fiber layer distension were significantly decreased after health coaching program by three and six months with significant different between first and second post assessment. Also, other disease related manifestations also showed similar findings. Regarding to visual analogue scale the mean of pain was significantly decreased after three and six months when compared to baseline with non-significant changes between both post assessment measures.

**Table (5):** Views that weight reduction in first post assessment showed significant positive correlation with total health coaching score and significant negative correlation with degree of papilledema as an indication of intracranial pressure reduction while, in second post assessment, it showed significant negative

correlation with headache attacks and analgesic use per week and degree of papilledema as an indication of intracranial pressure reduction.

**Table (1): Bio demographic criteria of studied patients (n = 45)**

<b>Bio Sociodemographic data</b>		<b>The studied patients n = 45</b>
<b>Age</b>	$\bar{x} \pm SD$	33.30±9.86
	Range	20 – 50
<b>Gender</b>	Male	7 (15.6)
	Female	38 (84.4)
<b>VM associated occupation</b>	Yes	28 (62.2)
	No	17 (37.8)
<b>Medical data</b>		
<b>IIH onset</b>	<1 month	18 (40.0)
	1 - <4 months	15 (33.3)
	4 - <6 months	2 (4.4)
	≥ 6 months	10 (22.2)
<b>Associated comorbidities</b>	DM	15 (33.3)
	HTN	19 (42.2)
	Atherosclerosis	13 (28.9)
<b>LP number</b>	2 times	5 (11.1)
	3 times	33 (73.3)
	4 times	7 (15.6)

DM: diabetes mellitus, HTN: Hypertension.

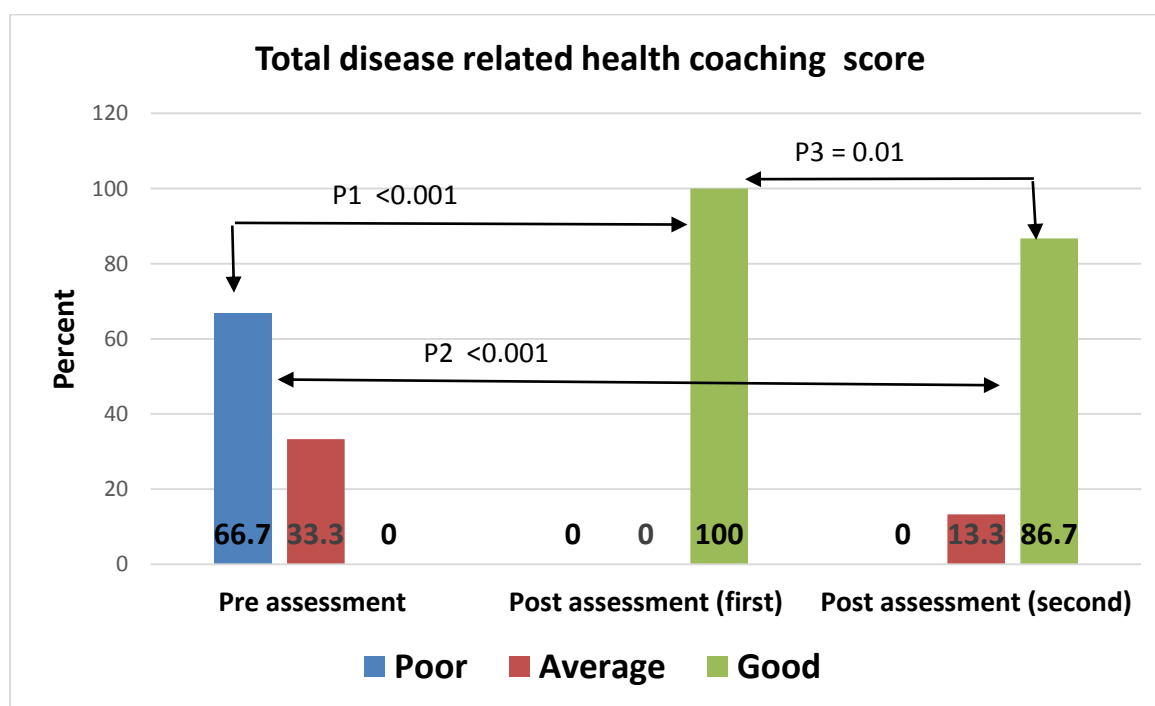
**Table (2): Disease related health coaching responses among studied patients throughout study phases (n = 45)**

Disease related health coaching responses	Parameters	The studied cases (n = 15)			P value
		Pre	Post 1	Post	
Weight reduction practice's coaching	Average	39 (86.7)	0 (0.0)	0 (0.0)	<0.001 <sup>1</sup>
	Good	6 (13.3)	45 (100)	45 (100)	<0.001 <sup>2</sup> ----- <sup>3</sup>
HTN & ICP reduction practice's coaching	Poor	9 (20.0)	0 (0.0)	0 (0.0)	<0.001 <sup>1</sup>
	Average	36 (80.0)	6 (13.3)	0 (0.0)	<0.001 <sup>2</sup>
	Good	0 (0.0)	39 (86.7)	45 (100)	0.013
Medications' side effects and complications prevention practice's coaching.	Poor	30 (66.7)	0 (0.0)	0 (0.0)	<0.001 <sup>1</sup>
	Average	15 (33.3)	39 (86.7)	6 (13.3)	<0.001 <sup>2</sup>
	Good	0 (0.0)	6 (13.3)	39 (86.7)	<0.001 <sup>3</sup>

1: comparing pre intervention measure with first post intervention measures

2: comparing pre intervention measure with second post intervention measures

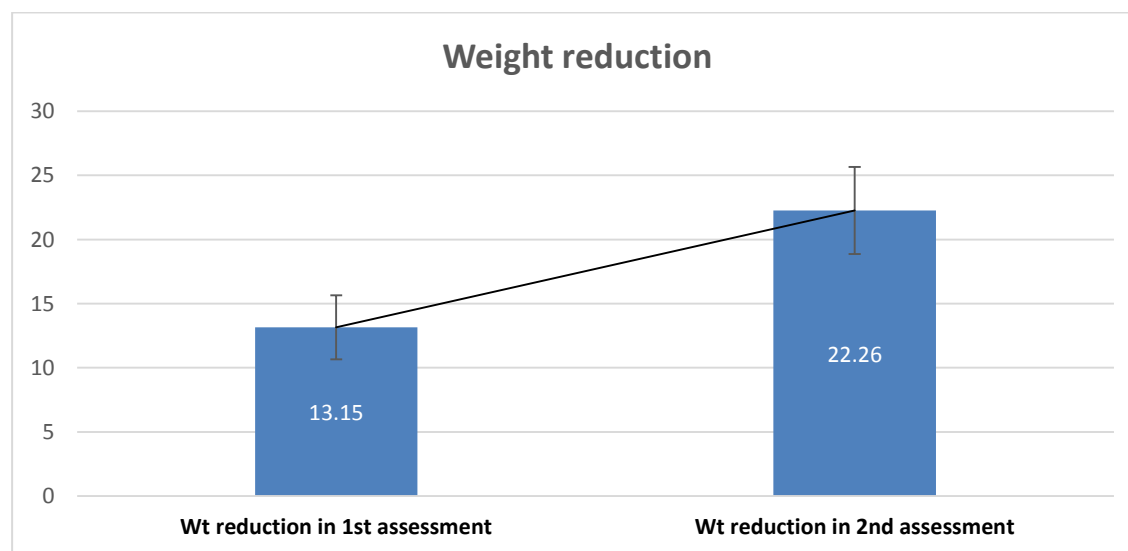
3: comparing first post intervention measures with second post intervention measures

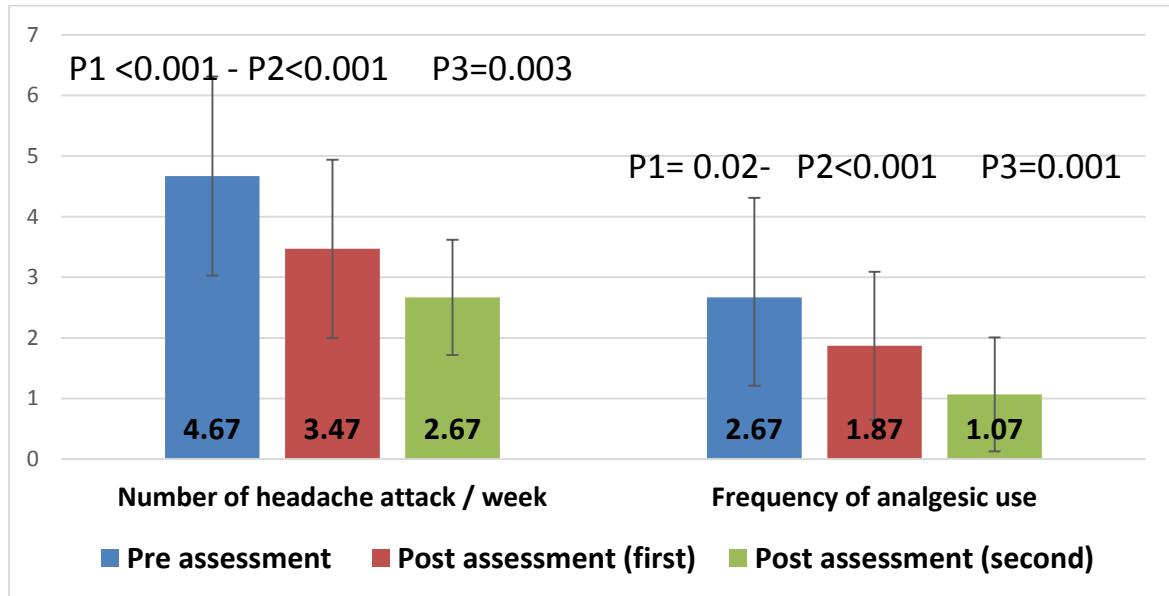
**Figure 1: Total disease related health coaching score among studied patients throughout study phases (n = 45)**

**Table (3): Indicators of patients' compliance with health coaching throughout study phases (n = 45)**

Indicators of patients' compliance with health coaching		The studied cases (n = 45)			Test	P value
		Pre	Post 1	Post 2		
<b>Wt</b>	$\bar{x} \pm SD$				10.99	<0.0011
	Range	84.67±4.81 72 – 90	73.53±4.80 65 – 80	65.73±3.39 60 – 72	21.57	<0.0012
					8.90	<0.0013
<b>SBP</b>	$\bar{x} \pm SD$				2.83	0.0061
	Range	126.67±13.65 110 – 150	119.33±10.87 90 – 130	113.33±10.87 90 – 130	5.12	<0.0012
					3.63	0.013
<b>DBP</b>	$\bar{x} \pm SD$				2.82	0.0061
	Range	81.33±7.26 70 – 90	77.67±4.84 70 – 85	75.33±5.04 70 – 80	4.55	<0.0012
					2.24	0.033
<b>K</b>	$\bar{x} \pm SD$				2.15	0.031
	Range	3.30±0.74 2.5 – 5.0	3.63±0.71 2.7 – 5.1	4.46±0.62 3.5 – 5.5	8.11	<0.0012
					5.96	0.0013
<b>ketonuria (No&amp; %)</b>		7 (15.6)	18 (40.0)	31 (68.9)	6.70	<0.011
					26.2	<0.0012
					7.57	0.0063

**Wt.:** Weight, **SBP:** Systolic blood pressure, **DBP:** Diastolic blood pressure, **K:** Potassium  
**1:** comparing pre intervention measure with first post intervention measures  
**2:** comparing pre intervention measure with second post intervention measures  
**3:** comparing first post intervention measures with second post intervention measures

**Figure (2): Percent of weight reduction among studied patients throughout study phases (n = 45).**



**Figure (3):** Frequencies of headache attacks and analgesic use per week among studied patients throughout study phases (n = 45).

**Table (4): Disease related objective and subjective assessment evaluation among studied patients throughout study phases (n = 45)**

Disease related objective and subjective assessment	The studied cases (n = 45)			Test	P value
	Pre	Post 1	Post 2		
<b>Eye related objective and subjective assessments</b>					
<b>Optic disc elevation</b>				4.22	<0.001
$\bar{x} \pm SD$	1.24±0.24	1.05±0.18	0.94±0.12	7.59	<0.001
Range	0.8 – 1.7	0.8 – 1.4	0.8 – 1.2	3.60	<0.001
<b>Optic nerve sheath diameter</b>				5.08	<0.001
$\bar{x} \pm SD$	4.83±0.51	4.30±0.47	3.95±0.43	8.73	<0.001
Range	4 – 5.5	3.5 – 5	3 – 4.5	3.64	<0.001
<b>Retinal nerve fiber layer distension</b>				3.06	0.002
$\bar{x} \pm SD$	147.67±35.56	119.93±42.13	97.67±30.99	4.92	<0.001
Range	105 – 200	50 – 200	50 – 150	2.88	0.004
<b>Degree of Papilledema (No&amp; %)</b>				<b>X<sup>2</sup></b>	
1	0 (0.0)	6 (13.3)	27 (60.0)	37.89	<0.001
2	12 (26.7)	33 (73.3)	12 (26.7)	49.09	<0.001
3	30 (66.7)	3 (6.7)	3 (6.7)	23.16	<0.001
4	3 (6.7)	3 (6.7)	3 (6.7)		
<b>Blurred vision (No&amp; %)</b>	18 (40.0)	9 (20.0)	0 (0.0)	4.29	0.03
				22.5	<0.001
				10.0	0.00
<b>Other objective and subjective disease related assessments</b>					
<b>Tinnitus</b>	41 (91.1)	18 (40.0)	6 (13.3)	26.3	<0.001 <sup>1</sup>
				54.55	<0.001 <sup>2</sup>
				8.18	0.004 <sup>3</sup>
<b>Dizziness</b>	43 (95.6)	14 (31.1)	7 (15.6)	40.24	<0.001 <sup>1</sup>
				58.32	<0.001 <sup>2</sup>
				3.04	0.08 <sup>3</sup>
<b>Cognitive disturbance</b>	13 (28.9)	12 (26.7)	5 (11.1)	0.06	0.81 <sup>1</sup>
				4.44	0.03 <sup>2</sup>
				3.55	0.06 <sup>3</sup>
<b>Back pain</b>	24 (53.3)	11 (24.4)	6 (13.3)	7.90	0.005 <sup>1</sup>
				16.20	<0.001 <sup>2</sup>
				1.81	0.18 <sup>3</sup>
<b>Neck pain</b>	18 (40.0)	7 (15.6)	6 (13.3)	6.70	0.01 <sup>1</sup>
				8.18	0.004 <sup>2</sup>
				0.09	0.76 <sup>3</sup>
<b>Radicular pain</b>	30 (66.7)	17 (33.3)	7 (17.8)	7.53	0.006 <sup>1</sup>
				24.28	<0.001 <sup>2</sup>
				5.68	0.02 <sup>3</sup>
<b>HIT Score</b>				6.0	<0.001
$\bar{x} \pm SD$	62.31±4.89	56.20±4.78	49.73±3.45	14.10	<0.001
Range	53 – 68	48 – 65	44 – 54	7.36	<0.001
<b>VAS <math>\bar{x} \pm SD</math></b>	4.60±1.47	3.27±1.07	2.87±1.04	U	<0.001
Range	2 – 7	2 – 5	1 – 5	4.26	<0.001
				5.24	0.10
				1.66	

**HIT : Headache impact test score , VAS: Visual analogue Scale**

- 1: comparing pre intervention measure with first post intervention measures
- 2: comparing pre intervention measure with second post intervention measures
- 3: comparing first post intervention measures with second post intervention measures

**Table (5): Correlation between weight reduction percent and other disease related outcomes**

Patients Outcomes	Weight reduction			
	Wt. reduction (first assessment)		Wt. reduction (second assessment)	
	R	P value	R	P value
Total health coaching practices score	0.31	0.04	0.15	0.32
Headache attacks / week	0.04	0.80	-0.69	<0.001
Frequency of analgesic use/ week	-0.1	0.35	-0.42	0.004
Papilledema degree	-0.52	<0.001	-0.30	0.04

### Discussion

Idiopathic intracranial hypertension can result in significant morbidity in young individuals who would otherwise be in good health if neglected or untreated. Its symptoms include elevated intracranial pressure, intense headaches that don't go away, and optic nerve swelling, or papilledema, which can cause irreversible vision loss and cognitive decline. Age, BMI, and female sex do not fully account for the pathophysiology of IIH, as the majority of cases include obese women who are of reproductive age (**Wardman et al., 2023**).

Thorough guidelines have been developed for the diagnosis and treatment of IIH. In medically resistant patients, ventriculoperitoneal and lumbo-peritoneal shunts are well-established surgical techniques for diverting CSF. However, these shunts merely lessen the visual effects of elevated ICP; they do not change the underlying illness process. Losing weight is still, for the most part, the most crucial and successful management technique. Therefore, this study aimed to examine the health coaching effectiveness in controlling idiopathic intracranial hypertension (**Sunderland et al., 2021**).

First hypothesis was accepted as this study reveal that weight, systolic and diastolic

blood pressure, were significantly decreased in first post-test assessment and continue decreasing significantly in second post assessment with(  $p\text{-value} < 0.001$ ), This result gets equal (**Abbott et al., (2023)** study titled "Weight Management Interventions for Adults with Idiopathic Intracranial Hypertension" which stated that diet, physical activity, and behavioral lifestyle modifications gave an evidence for modest weight loss with a BMI  $< 35$  kg/m<sup>2</sup> (grade B), they recommended obesity reduction with IIH for not only ICP reduction but also for mortality, prevalence and incidence burden and obesity-related complications reduction.

Also, the recent study showed that weight with intracranial pressure, systolic and diastolic blood pressure, were significantly decreased after three and six months from the health coaching program which was in the same line with (**Lee et al., (2020)**), who studied "Patient-centered counseling program using health coaching to promote self-care among elderly hypertension patients" they evident positive changes after counseling program with significant improvements in knowledge, medication compliance, diet, self-efficacy, health status, smoking, alcohol, exercise, SBP, and DBP. As a point of view, with comprehensive program patients'



compliance viewing multiple improvements within all domains at the same time.

In relation to blood and intracranial pressure monitoring health coaching practice application, this study recorded that majority of patients had average level in the first post while all of them improved to good level within the second post with significant difference between both post assessment measurements. (Pinto, (2018) supported our study when stated that IIIH management principles should be targeted toward maintenance of cerebral perfusion pressure by lowering ICP through elevation of the head of the bed, maintain the neck on midline to facilitate venous drainage from the head". From researchers' point of view, this elevation shouldn't exceed 30 degrees to prevent cerebral perfusion impairment.

Also, (Abbott et al., (2023) supported our study as they found that rising of 40 cm CSF with Valsalva maneuvers within 16 seconds from initiation among people with IIIH related to cerebrovascular status changes. From the viewpoint of researchers, as these activities are part of daily living, patients' compliance with coached practice to manage their blood pressure and intracranial pressure is the cornerstone rather than medication.

Oppositely, (Yiangou et al., (2024) ,who studied "The Impact of Valsalva Manoeuvres and Exercise on Intracranial Pressure and Cerebrovascular Dynamics in Idiopathic Intracranial Hypertension" reported that, the substantial intracranial hypertension during Valsalva maneuvers is similar to pattern of BP changes with no lasting effect on ICP after a VM, as the increase was short-lived.

Second hypothesis was accepted when this study showed significant elevation in serum potassium level after health coaching by three and six months , this was in agree with (Thaller et al., (2023) ,who studied "The idiopathic intracranial hypertension prospective cohort study: evaluation of prognostic factors and outcomes" they reported that acetazolamide as a drug of choice, producing hypokalemia as a side effect, as well as bradycardia, Electrolyte imbalance, acid/base disorders, weight/appetite, and neurologic symptoms ,so it is essential to monitor all patients taking acetazolamide for these adverse effects. In the same line with (Mondragon and Klovenski, (2019) ,who stated that complications are mainly due to Acetazolamide side effects which actually cause hypokalemia, extremities paresthesia and dysgeusia.

The third hypothesis was accepted based on this result which said that preintervention there was poor total practice level among two thirds of studied patients which promoted to good level among the majority 100% and 86.7% of studied patients after health coaching program by three and six months respectively. This result supported by (Gordon et al., (2017), who studied "Clinical effectiveness of lifestyle health coaching" and reported that comprehensive lifestyle health coaching helps participants favorably modify multiple behaviors as exercise training/physical activity, nutrition, and tobacco use. Its results gave a relevant improvement in multiple biomarker risk factors as SBP and DBP, total CHOL, LDL & HDL cholesterol, TG, FBG, body weight, BMI, WC, and cardiorespiratory fitness in diverse populations. Researchers link this back to that , when patients observe their

improvements after the health coaching practices compliance , they intend to continue to alleviate all disease related manifestations or /and complications.

Fourth hypothesis was accepted because current study results stated a noticeable reduction in headache attacks and analgesic use/ week. This result agrees with results of (Mollana, (2021) on “Intracranial pressure directly predicts headache morbidity in idiopathic intracranial hypertension “who said that the mean headache severity had improved after intervention, with a concurrent reduction in the headache frequency (monthly headache days 15.1 (SD  $\pm$ 11.5) and monthly analgesic use (8.6 (SD  $\pm$ 9.8). According to researchers, headache resulting from pressure existed by accumulated intracranial CSF, so when CSF production decreased as a result of weight reduction, the headache will relive, consequently analgesic intake will reduce and other disease manifestations.

Fifth hypothesis was accepted as illustrated in this study which reported a significant weight reduction with eye related disorders including blurring of vision, degree of papilledema, Optic disc elevation, Optic nerve sheath diameter and retinal nerve fiber layer distension were improvement over the time of intervention and follow up. This result go along with (Abbott et al., (2023) study titled “Weight Management Interventions for Adults With Idiopathic Intracranial Hypertension” who saw that visual characteristics generally became better with time as 15% reduction in weight along with notable improvements in low-contrast visual acuity, HVF, and OCT assessments of papilledema (Level 2++) was reported. Also, (Mollan (2018), who study “Evaluation and management of adult

idiopathic intracranial hypertension “ said that after losing weight (stage 2), all objective papilledema assessment improved: thickness of the peripapillary retinal nerve fiber layer, width of the optic nerve sheath, and elevation of the optic disc. Researcher's opinion indicates that resolved papilledema is the normal sequencies of weight reduction which decrease CSF production that will limit the fluid retained within eye casing optic nerve swelling/ papilledema.

Last hypothesis was accepted as, the pain frequency, duration and severity , back pain, tinnitus and neck pain, were significantly decreased in first and second post assessment when compared to baseline, which come in similarity with (Mollanb,(2021),who study “Effectiveness of bariatric surgery vs community weight management intervention for the treatment of idiopathic intracranial hypertension “ and stated that patients demonstrated mild pain which improved with reduction in ICP as well as the overall life quality improvements. In the opinion of researchers, these improvements come back to ICP reduction as a result of weight reduction and other health coaching practice compliance.

### Conclusion

The nursing health coaching program application has proven potent positive effectiveness on patients with IIH. Patients' disease related practices level about weight reduction, managing hypertension and intracranial hypertension, medications' side effects and complications prevention was improved after health coaching which led to intracranial pressure reduction reflected on patients' little headache attacks per week, decreased disease related signs and symptom's severity and frequencies,

resolved papilledema with improved visual function.

### Recommendations

#### For practice and education

-Nursing health coaching program should be applied among all patients with IHH as an effective non pharmacological, non-surgical conventional method, thus appropriate to control all disease related manifestations.

-Obesity prevention, early detection and proper management is absolutely required to suppress the disease progression and give a better outcome.

-Motivational interviewing supplied with an illustrative pamphlet should be routinely distributed among patients with IHH.

-Multidisciplinary team including neuro-ophthalmologist, neurologist, and dietician with neuropsychological rehabilitation might be feasible in corporation for managing patients with IHH.

-Establishing an easy access to frequent IHH follow-up visits as it is necessary for awareness, management and research.

-Study replication with larger sample sizes in different geographical area is recommended to confirm its effectiveness.

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