University of Dhaka

IONTOPHORESIS AS A TREATMENT FOR PRIMARY HYPERHIDROSIS: A QUASI-EXPERIMENTAL STUDY

By

Ibrahim Khalil Nayem

Bachelor of Science in Physiotherapy

DU Roll No: 517

Registration No: 8664

Session: 2017-18

BHPI, CRP, Dhaka-1343

Bangladesh Health Professions Institute (BHPI)

(The academic institute of CRP)

Faculty of Medicine, Affiliated by

University of Dhaka

[September, 2023]

IONTOPHORESIS AS A TREATMENT FOR PRIMARY HYPERHIDROSIS: A QUASI-EXPERIMENTAL STUDY

A Research presented to the
Bachelor of Science in physiotherapy
Bangladesh Health Professions Institute
(The academic institute of CRP)
University of Dhaka

By

Ibrahim Khalil Nayem

mdiknayem99@gmail.com

Supervisor

Muhammad Millat Hossain

Associate Professor
Department of Rehabilitation Science
Bangladesh Health Professions Institute (BHPI)

In partial fulfillment of the requirements for the degree of

B.Sc. in Physiotherapy

[September, 2023]

APPROVAL

We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled-

IONTOPHORESIS AS A TREATMENT FOR PRIMARY HYPERHIDROSIS: A QUASI-EXPERIMENTAL STUDY

Submitted by **Ibrahim Khalil Nayem,** for the patial fulfillment of the requirement for the degree of Bachelor of Science of Physiotherapy (B.Sc. PT).

…….
Muhammad Millat Hossain
Associate professor
Department of Rehablitaion Science
BHPI, CRP, Savar, Dhaka

…….
Professor Md. Obaidul Haque
Vice Principal
BHPI, CRP, Savar, Dhaka

…….
Dr. Mohammad Anwar Hossain, PhD
Associate Professor, Department of Physiotherapy, BHPI
Senior Consultant & Head, Department of Physiotherapy
CRP, Savar, Dhaka

Approval Date:

DECLARATION

I am **Ibrahim Khalil Nayem**; declare that all the sources used in this study have been cited correctly. All errors of this project is mine and I am only responsible for any mistake in the whole study.

.....

Ibrahim Khalil Nayem
4th Year B.Sc in Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Savar, Dhaka- 1343
Bangladesh

DEDICATION

Dedicated to All the hyperhidrosis sufferers who are overlooked as a patient but suffers physically and mentally.

TABLE OF CONTENTS **Page No**

List of Figures

List of Tables

List of Annexure

List of Acronyms

Abbreviation	Elaboration
BHPI	Bangladesh Health Professions Institute
CRP	Centre for the Rehabilitation of the Paralysed
DCPT	Dhaka College of Physiotherapy
HDSS	Hyperhidrosis Disease Severity Scale
HH	Hyperhidrosis
HidroQoL©	Hyperhidrosis Quality of Life Index
SPSS	Statistical Package for Social Sciences

ACKNOWLEDGEMENT

My study was conducted under Physiotherapy Department of Bangladesh Health Professions Institute. At first I want to express my gratitude to the almighty **ALLAH** who has given me enough ability, patience, passion, focus, concentration and intelligence for complete the study successfully in time. I am grateful to my family members for supporting and encouraging me in crucial time of the study.

This project would not complete without the help of my teachers. I am extremely grateful to my honorable supervisor Muhammad Millat Hossain**,** Associate Professor & Course Coordinator, Department of Rehabilitation Science, BHPI; for his excellent guidance throughout the whole research project and for being such an excellent supervisor. In addition, I would like to pay my sincere thanks to honorable Professor Md. Obaidul Haque, Vice-Principal, BHPI and Dr. Mohammad Anwar Hossain, PhD, Associate Professor, Department of Physiotherapy, BHPI **&** Senior Consultant & Head, Department of Physiotherapy for their kind support and motivation. I would like to thanks Professor Dr. Md. Omar Ali Sarker, Head of Education, CRP for giving me the permission to collect data from all educational institute of CRP. I would like to offer special thanks to Dr. Kazi Md. Amran Hossain, Lecturer, PTR Department, JUST for his continuous support and advice. I would also like to acknowledge PTR Department JUST and Bibeat Ltd for lend me iontophoresis machine to conduct the research.

I want to recommend Dr. Shohag Rana and Sabiha Muhammad Sabrin for completing the diagnosis process. I specially want to pay thanks my beloved Tasnuva Sadia for her help to entry the data and complete alignment of the book. I also like to thanks Fyzul Kabir, Dhruba Roy Shawon and MH Sazid with the feeling of gratitude for their extending helpful hands to complete data collection process.

Special thanks to the entire participant of this study for their cooperation. I extent my best wishes and thanks to all who directly or indirectly helped me during conducting my research. Without their help, it was not possible to conduct this study.

ABSTRACT

Primary hyperhidrosis is a chronic condition characterized by excessive sweating beyond what is necessary for thermoregulation, often leading to significant physical discomfort and emotional distress. Iontophoresis has emerged as a non-invasive treatment option for managing primary hyperhidrosis. This experimental study aimed to investigate the effectiveness of iontophoresis in reducing sweat production and improving the quality of life in individuals with primary hyperhidrosis.

A total of 111 responses what was founded from online survey, pestering and other media. 37 participants showed their interest to take the treatment of primary hyperhidrosis. From them 28 participants completed the full dose of treatment. Diagnosis was done in two centers by two Physiotherapy professional who were aware about the iontophoresis, it's application and precision. Application of intervention was also done under their supervision. One center was BHPI, CRP and another center was DCPT. The severity of hyperhidrosis was assessed using the Hyperhidrosis Disease Severity Scale (HDSS), Minors Starch-iodine test and Hyperhidrosis Quality of Life Index (HidroQoL©) at before the intervention and after 9-10 session.

The iontophoresis treatment involved the application of a mild electrical current to the affected areas, such as the palms, soles, or axillae, using specialized iontophoresis devices. This study was done only for palmer hyperhidrosis. Participants received treatment sessions three times per week for three weeks.

Results demonstrated a significant reduction in HDSS scores after 9-10 session ($p < 0.05$). After complete the sessions, all of the participants reported a decrease in HDSS score by two or more categories, indicating a clinically meaningful improvement in hyperhidrosis severity.

Furthermore, participants reported a considerable decrease in sweat production, as measured by Minors Starch-iodine test, from baseline to 9-10 sessions ($p < 0.001$).

The treatment was well-tolerated, with no severe adverse events reported. The most commonly reported side effect was mild skin irritation in some participants. However, the irritation was transient and did not deter participants from continuing with the treatment.

In addition to reducing hyperhidrosis severity, the iontophoresis treatment had a positive impact on participants' quality of life. The Hyperhidrosis Quality of Life Index (HidroQoL©) improved significantly among the participants after 9-10 sessions ($p < 0.01$), indicating a substantial enhancement in overall well-being and psychosocial functioning.

Keywords: *Hyperhidrosis, Iontophoresis.*

Word Count: 10440

CHAPTE- I INTRODUCTION

1.1 Background

Hyperhidrosis is a frequent condition, affecting nearly 3% of the population. It can be triggered by occupational, psychological, or physiological factors, and around half of those affected experience moderate to severe symptoms. Consequently, it negatively impacts the quality of life, particularly among individuals aged 18 to 54 years old, who have the highest prevalence rates.

The human body contains approximately 1.6 to 4 million apocrine and eccrine sweat glands, distributed with varying densities. For instance, there are 64 glands per square centimeter on the back, 181 glands per square centimeter on the forehead, and 700 glands per square centimeter on the palms. The regulation of thermoregulatory control involves cerebral cortical structures, the anterior hypothalamus, and the sympathetic nervous system.

Although the exact pathophysiology of focal primary hyperhidrosis is not fully understood, it is believed to be associated with over-stimulation through an autonomic pathway. Despite this, experts do not consider hyperhidrosis to be a neuropsychiatric condition was argued (Hornberger et al. 2004, p. 276).

Iontoporosis was first utilized as a treatment for hyperhidrosis in 1968, and since then, it has been consistently used to manage this condition. This therapy has proven to be effective, safe, and relatively affordable for treating primary hyperhidrosis was argued (Lear et al. 2007, p. S69).

1.2 What is Hyperhidrosis?

Hyperhidrosis is a condition characterized by excessive sweating, which can occur either in specific areas of the body or affect the entire body. Focal hyperhidrosis, where sweating is concentrated in certain regions, is especially common in the armpits, hands, feet, and face. The exact underlying mechanisms of focal hyperhidrosis are not yet fully understood. However, patients with this condition typically have a normal number of sweat glands, but they appear to produce an excess amount of sebum was argued (Solish et al. 2007, p. 909).

Hyperhidrosis that onset without any other complication as like infection, drug, endocrine, neurological disorder etc. is called primary hyperhidrosis. If there is an occurrence of excessive sweating by those complications is defined as secondary hyperhidrosis was argued (Benson et al. 2013, p. 1).

1.3 Diagnosis of Primary Hyperhidrosis

The following criteria are recommended for establishing the diagnosis of primary focal hyperhidrosis: Focal, visible, excessive sweating of at least 6 months duration without apparent cause with at least two of the following characteristics:

-Sweating generally occurs in both sides in same time.

-Hampers daily activities.

-Occurs at list once in a week.

-Age of onset less than 25 years.

-Have previous occurrence in family.

-No problematic or abnormal sweating during sleeping was argued (Hornberger et al. 2004, p. 276).

Severity measurement tool: Starch, which is a type of complex carbohydrate, can react with elemental iodine (I2, in its brown form) to produce a blue-black precipitate when water is present. To conduct tests using this reaction, the most suitable iodine source is a solution containing 3.5% iodine in alcohol. Alternatively, some sources suggest using a 1% povidone-iodine solution for the same purpose was argued (Swinehart 2009. p. 393).

It's also calls Minor's Starch-iodine test.

Procedure: The iodine solution is applied to a clean and dry examination site, and then it is left to air dry. After that, powdered cornstarch is lightly applied using a cotton ball. If sweating occurs at the site, blue-black dots will appear as a result of the reaction between the iodine and starch, indicating the presence of hyperhidrosis. This test helps in diagnosing the condition and locating areas of excessive sweating was argued (Swinehart 2009. p. 394).

Test area is measured with a double square lattice grid with a "grid constant" of 1 **cm^2** was argued (Bahmer and Sachse 2008, p.1744).

It can also use to measure the prognosis.

1.4 Differential diagnosis

Infective: Acute viral or bacterial infections; chronic infections, such as tuberculosis, malaria, brucellosis

Drugs: For example, alcohol, cocaine, heroin (including withdrawal), ciprofloxacin, aciclovir, esomeprazole, sertraline, and other antidepressants

Endocrine: Diabetes, hyperthyroidism, menopause, pregnancy, carcinoid syndrome, hyperpituitarism, pheochromocytoma, acromegaly

Neurological disorders: Stroke, spinal cord injuries, gustatory sweating after parotidectomy, Parkinson's disease

Other: Lymphoma and other myeloproliferative disorders, congestive heart failure, anxiety and obesity was argued (Benson et al. 2013, p. 2).

1.5 Treatment Options

AC Hexahydrate Therapy: For mild to moderate palmar hyperhidrosis, the recommended initial treatment is the use of topical Aluminum Chloride hexahydrate either in absolute ethanol or in a salicylic acid gel. It is considered the therapy of first choice in such cases. To minimize skin irritation, an initial concentration of 10% to 12% of Aluminum Chloride can be tried. This treatment aims to reduce excessive sweating and improve the condition was discussed (Woolery-Lloyd and Valins 2009, p. 28).

Iontoporosis: Iontophoresis is a method used to improve the delivery of drugs through the skin by employing two mechanisms: electrorepulsion and electroosmosis. At a pH of 7.4, the skin carries a negative charge and acts as a selective barrier for cations. When a current is applied during iontophoresis, it induces a net solvent flow from the anode to the cathode, facilitating the movement of cations while inhibiting anion transport. This process enables the enhanced transdermal transport of neutral and polar solutes.

The relative significance of electrorepulsion and electroosmosis during iontophoresis depends on the characteristics of the membrane and the substance being delivered. Moreover, the negative charge of the skin can be altered by the application of Iontoporosis, potentially reducing or even reversing its negative charge. This technique has been subject to debate and discussion in the context of iontophoresis-based drug delivery was discussed (Pariser and Ballard 2014, p.491).

Others: Glycopyrrolate (1–2 mg) can be taken up to three times per day was discussed (Baker 2016, P.1).

Botulin A injections is also uses as a treatment of hyperhidrosis was argued (Solish et al. 2007, p. 910).

1.6 Which treatment was used

Iontophoresis was used for the research to explore the effectiveness of Iontoporosis as a treatment for hyperhidrosis in Bangladeshi clinical settings. The application of iontophoresis was employed for plantar hyperhidrosis to investigate its effectiveness.

1.7 About Iontophoresis

Iontophoresis is a method used to improve the delivery of drugs through the skin by employing two mechanisms: electrorepulsion and electroosmosis. At a pH of 7.4, the skin carries a negative charge and acts as a selective barrier for cations. When a current is applied during iontophoresis, it induces a net solvent flow from the anode to the cathode, facilitating the movement of cations while inhibiting anion transport. This process enables the enhanced transdermal transport of neutral and polar solutes.
The relative significance of electrorepulsion and electroosmosis during iontophoresis depends on the characteristics of the membrane and the substance being delivered. Moreover, the negative charge of the skin can be altered by the application of Iontoporosis, potentially reducing or even reversing its negative charge. This technique has been subject to debate and discussion in the context of iontophoresis-based drug delivery was argued (Guy et al. 2000, p.129).

1.8 Contraindication of Iontoporosis

- Pregnancy.
- Past history of cardiac arrhythmia.
- Cardiac pacemaker.
- Narrow angle glaucomawas argued (Dolianitis et al. 2004, p. 209).

1.9 Rational

There are thousands of researches have done worldwide about the effect of iontoporosis for treat hyperhidrosis, but there is no establish practice of it in Bangladesh. Hyperhydrosis has direct effect on function. One can't do his functional movement due to excessive sweating. It has a negative effect on sports players was argued (Paller et al. 2012, p. 919)

Physiotherapists have their own role to make functional movement more perfect and solve the movement related problem.

The study was conducted on palmar hyperhidrosis, as it was a convenient site from a Bangladeshi social aspect. Conducting the study for axillary hyperhidrosis in the Bangladeshi socio-demographic context was found to be difficult.

1.10 Improvement Measurement Tools:

Subjective Test: It's also calls Minor's Starch-iodine test.

Test area is measured with a double square lattice grid with a "grid constant" of 1 **cm^2** was argued (Bahmer and Sachse 2008, p.1744).

It can also use to measure the prognosis.

Objective Scale:

Hyperhidrosis Disease Severity Scale: The Hyperhidrosis Disease Severity Scale (HDSS) is a 4-point scale used to assess the severity of primary hyperhidrosis. It can be administered either by an interviewer or completed by the patient themselves. The HDSS evaluates the severity of the patient's condition by assessing how much excessive sweating impacts their daily activities and quality of life. The scale helps to gauge the extent to which hyperhidrosis interferes with a person's ability to carry out their regular activities and the overall impact it has on their daily life was argued (Kowalski et al. 2004, p. P51).

1.11 Problem Statement

Excessive sweating due to hyperhidrosis can significantly impair individuals, interfering with their daily activities and causing social embarrassment. This condition negatively impacts one's ability to function effectively in the workplace, participate in public events, interact with others, and form personal relationships. Many patients find themselves changing their clothing multiple times per day due to excessive sweat. Research has shown that more than half of the patient's experience moderate to severe emotional effects as a result of hyperhidrosis.

Standardized and validated quality-of-life surveys have revealed that the negative impact of hyperhidrosis is comparable to other serious medical conditions, such as severe psoriasis, end-stage renal disease, rheumatoid arthritis, and multiple sclerosis. However, despite the significant impact on their lives, the majority of patients (approximately 62%) are hesitant to discuss their hyperhidrosis with healthcare professionals. This might be due to feelings of embarrassment or lack of awareness about available treatment options was argued (Hornberger et al. 2004, p. 276).

1.12 Objectives

General Objectives

Iontophoresis is established as an effective treatment for primary hyperhidrosis. It is comparatively less expensive than any other treatment of hyperhidrosis. After all, iontophoresis can be classified as electrotherapy which is a part of Physiotherapy was discussed (Meena, Kumar and Reinai 2021, p. 137).

As a Physiotherapy student I must pay priority of physiotherapy intervention of any complication. An organized research in Bangladesh may encourage Bangladeshi physiotherapy practitioner to use this.

Specific Objective

- To explore the effectiveness of iontophoresis for hyperhidrosis in Bangladeshi hospital seating.
- To establish Iontophoresis as a reliable treatment option for excessive sweating.
- To establish clinical practice of it so that general hyperhidrosis sufferers of Bangladesh can get proper treatment and not be a victim of malpractice.

1.13 Operational Definition

Hyperhidrosis: Hyperhidrosis is a condition in where there is a presence of excessive sweating beyond than normal was argued (Solish et al. 2007, p. 909).

Iontophoresis: Iontophoresis is the process by which an ionized substance is passed through healthy skin by using a direct electrical current was argued (Pariser and Ballard 2014, p.491).

1.14 Hypothesis

Iontophoresis is an effective treatment procedure for hyperhidrosis.

1.15 Null Hypothesis

Iontophoresis is not an effective treatment procedure for hyperhidrosis.

CHAPTER - II LITARATURE REVIEW

An epidemiological study conducted in both America and Canada found that primary hyperhidrosis affects approximately 3% of the population, indicating that it is not a rare condition. The study reviewed a total of 508 patient medical records, with 62.8% of the patients being female. The mean age of patients at the Canadian clinic was 30.3 years, while at the American clinic, it was 28.1 years with a median age of 25 years was discussed (Moraites, Vaughn and Hill 2014, P. 457).

There is evidence of a genetic involvement in primary hyperhidrosis, with a positive family history found in 30% to 65% of patients. The highest prevalence of the condition occurs between 18 and 54 years of age. The most common areas affected by primary hyperhidrosis are the palms, soles, axillae, face, and scalp.

Regarding ethnicity, a significant majority of American patients were Caucasian (87.9%), followed by African Americans (8.4%), Asians (1.7%), Hispanics (0.8%), Indians (0.8%), and others (0.4%). The American patient population was categorized as students, business workers, professionals, home workers, laborers, retirees, disabled persons, travelers, security personnel, and unemployed individuals, in descending order of frequency.

Some common aggravating factors reported by patients in both clinics were stress, heat, and exercise. Men were more likely to present with facial or scalp hyperhidrosis, and they were also more likely to have additional areas of hyperhidrosis compared to women. On the other hand, women were more likely to have plantar hyperhidrosis.

Patients with hyperhidrosis of palms, soles, or palmoplantar regions were significantly more likely to report stress and anxiety as aggravating factors. Patients with facial and scalp hyperhidrosis were more likely to list food, exercise, and heat as aggravating factors. Axillary hyperhidrosis tended to develop after puberty, while isolated hyperhidrosis of palms and soles was more likely to have its onset after puberty was argued (Lear et al. 2007, p. S69, S70).

Hyperhidrosis refers to excessive sweating from the eccrine glands beyond what is necessary for regulating body temperature. It is challenging to establish a standardized

measure for normal sweat production due to variations in body surface area, making any significant excess of sweating abnormal if it significantly disrupts daily activities.

There are two types of hyperhidrosis: primary idiopathic and secondary hyperhidrosis. Primary idiopathic hyperhidrosis is typically focal, affecting specific areas like the axillae, palms, soles, and craniofacial region. Its exact cause is unknown, and it affects otherwise healthy individuals without any underlying illness

Secondary localized hyperhidrosis, on the other hand, can be linked to specific causes, such as surgical trauma to the parotid glands or neurological damage. Various stressors, including emotional, thermal, and vasodilatory factors, can further exacerbate focal hyperhidrosis. Prolonged exposure to moisture may lead to skin maceration, secondary skin infections, or unpleasant odor (bromhidrosis).

Generalized hyperhidrosis affects most of the body's surface and is typically associated with an underlying medical condition that requires investigation and management.

In summary, hyperhidrosis can be classified into primary idiopathic and secondary hyperhidrosis. The former is focal and occurs without any known underlying illness, while the latter is often linked to specific causes and may affect a larger portion of the body was argued (Solish et al. 2008, p. 133).

For a long time, hyperhidrosis was thought to be a harmless and unimportant medical condition. In actuality, hyperhidrosis seriously limits the social connections and professional pursuits of persons who suffer from it. The social embarrassment of children with palmar hyperhidrosis may resist them from participating in computer use, sports, or holding hands with other kids. Sometimes homework or artwork at school might increase anxiety. Adolescent patients frequently experience emotional insecurity, alienation, and self-blame because they typically think they are the only ones with this ailment. Typically, adolescents are relieved to find that hyperhidrosis is treatable condition. Additionally, adult patients have more limits and are more likely to worry about stigma, discrimination, and their capacity to build good connections was argued (Solish et al. 2008, p. 133).

Diabetes mellitus, Parkinson's disease, hyperthyroidism, hyperpituitarism, anxiety disorder, pheochromocytoma, and menopause are frequently recognized as contributory factors to secondary hyperhydrosis. According to reports, Parkinson's

disease-related hyperhidrosis favors the head, neck, and trunk and can happen with or without heat provocation. In an epidemiologic study of 284 pheochromocytoma patients, 49% of them reported excessive perspiration. In the context of severe hypertension, pheochromocytoma is connected to the the group of hyperhidrosis (sometimes characterized as widespread or truncal), headaches, and palpations, all of which may be paroxysmal in reaction to surges of catecholamine release from the tumor. A 72-year-old man's paroxysmal hyperhidrosis in a band across his back was the pheochromocytoma's presenting symptom was founded in the recent studies. The dyshidrosis associated with diabetes mellitus has been documented and can range from gustatory hyperhidrosis to upper body hyperhidrosis to pedal anhidrosis. It may be related to autonomic neuropathy as well as inadequate glycemic management was argued (Walling 2011, P. 693).

Body temperature regulation involves the coordination of several brain regions and the autonomic nervous system. The cerebral cortical regions, anterior hypothalamus, and sympathetic nervous system all play crucial roles in this process.

The hypothalamic preoptic sweat center sends nerve fibers to the ipsilateral (same side) brainstem, where they connect to their corresponding anatomical regions. Additionally, these nerve fibers also connect with the intermediolateral cell nuclei of the spinal cord.

This complex network allows the brain to receive information about body temperature and, in response, modulate sweating through the activation of the sweat glands via the sympathetic nervous system. By adjusting the sweating rate, the body can release excess heat to cool down or reduce sweating to conserve heat and maintain thermoregulatory balance. The last nerve fibers to innervate the sweat glands are postganglionic sympathetic nerve fibers, which are not myelinated. Noradrenalin is frequently used as the peripheral neurotransmitter in sympathetic innervation.

However, acetylcholine is what induces eccrine secretion at the periglandular nerve terminals. Although they also function as neurotransmitters at the location, catecholamines and neuropeptides are not known to play a part in hyperhidrosis. The neurogenic overactivity or hyperexcitability of the reflex pathways involving healthy eccrine glands is the most likely cause of primary focal hyperhidrosis. The complicated malfunction of the sympathetic and parasympathetic pathways of the autonomic systems may be the cause of the hyperexcitability. The hypothalamic nuclei, prefrontal regions, or their cholinergic linkages downstream are suggested

sources of dysfunction. The autonomic dysfunction associated with hyperhidrosis has been the subject of numerous research was argued (Solish et al. 2008, p. 134).

Sweat glands receive neural signals from the sympathetic chain at the T2 and T3 levels, which are also located along the direct sympathetic innervation pathway of the heart. The cardiovascular system is delicately controlled by the balance between opposing parasympathetic (vagal) and sympathetic activity.

A study investigated the link between sympathetic hyperactivity, palmar hyperhidrosis, and cardiac autonomic regulation. Both individuals with normal sweating and those with hyperhidrosis underwent autonomic functioning tests, such as the Valsalva maneuver and cold immersion technique, to assess sympathetic activity. The degree of autonomic dysfunction was evaluated based on reflex bradycardia (a decrease in heart rate) and the rate at which the hands warmed up after being submerged in an ice bath.

Comparing hyperhidrotic individuals to normal controls, higher sympathetic activity was observed in the former group. Hyperhidrotic individuals exhibited a less significant decrease in heart rate and lower finger temperature in response to cold immersion, likely due to a greater degree of cutaneous vasoconstriction.

The study further demonstrated that surgically removing the T2 and T3 sympathetic ganglia through a T2-T4 sympathectomy resolved both the sympathetic dysfunction and excessive sweating experienced by individuals with hyperhidrosis. This indicates that the sympathetic hyperactivity is related to the palmar hyperhidrosis and impacts cardiac autonomic regulation was argued (Solish et al. 2008, p. 134).

There is a precise diagnostic protocol and a special test also founded for diagnose primary hyperhidrosis. The test's name is Starch-iodine test. It is test by Starch (a multicaron-polysacaride) combined with elemental iodine. (Swinehart 2009. p. 394).

There are several improvement measurement scales are uses to measure the condition before and after intervention. One of the most popular scal is Hyperhidrosis Disease Severity Scale (HDSS) was argud (Kowalski et al. 2004, p. P51).

The HDSS and the Dermatology Life Quality Index (DLQI) were frequently combined found has been used in many study was argud (Wade et al. 2018, P. 304).

Dermatology Life Quality Index (DLQI) also uses individually to access the improvement of quality of life was discussed (Loo et al. 2003, p. 281).

Treatment of primary Hyperhidrosis includes aluminum chloride, salicylic acid gel, botulin A injection and iontophoresis. Aluminum chloride is use for mild case. Cells in the sweat ducts absorb aluminium ions, which leads to an increase in water inside the cells through osmosis. This causes the duct exit site to swell, blocking the release of sweat onto the skin. The effects of this drug are not permanent based on all the trials conducted.

No formal trials have been conducted to determine the duration of the effects of aluminum chloride after stopping the treatment. In the United Kingdom, all forms of aluminum chloride products (powder, roll-on, spray) are authorized for use on any part of the body and can be purchased online or over the counter without a prescription. These products are typically used daily, applied at night on dry skin, in conjunction with regular antiperspirants. As symptoms improve, they can be used as needed. The most commonly reported side effect is skin irritation, but other side effects may vary depending on the specific product used.

If aluminum chloride does not provide improvement, iontophoresis may be used. However, iontophoresis can be difficult to administer and may frequently cause irritation, especially in cases of axillary hyperhidrosis.

Systemic anticholinergic drugs can also be used, but they may cause adverse effects such as dry eyes, dry mouth, and problems with urinary voiding, including retention when used in the doses required to reduce hyperhidrosis symptoms.

If topical and systemic therapies are not effective or not tolerated, intradermal injection of botulinum toxin may be administered to the areas of excessive sweating.

Finally, if all these treatments fail or the patient cannot tolerate them, thoracoscopic sympathectomy can be considered as a last resort treatment was argued (Benson et al. 2013, p.1).

The effectiveness of home treatment for hyperhidrosis is crucial because iontophoresis requires regular maintenance. A study was conducted involving 25 patients, and complete data were collected. The mean age of the participants was 32.7 years. The onset of hyperhidrosis was most commonly in childhood, with the most prevalent pattern being palmoplantar with axillary hyperhidrosis. Most patients rated their condition as severe, significantly impacting their quality of life.

During hospital iontophoresis, 22 individuals (88%) experienced transient adverse effects, such as tingling and stinging. One patient achieved a decrease in axillary hyperhidrosis but developed new onset craniofacial compensatory hyperhidrosis.

Overall, 18 patients (72%) reported significant improvement in their symptoms and quality of life with hospital iontophoresis. As a result, 13 patients (52%), who all reported significant improvement with hospital iontophoresis, purchased a home unit for ongoing treatment.

Among those using home iontophoresis, 15% reported no improvement from baseline hyperhidrosis, 15% reported mild improvement, 31% reported moderate improvement, and 38% experienced a significant improvement in hyperhidrosis symptoms. Around 38% reported greater than 80% improvement in symptoms, significantly enhancing their quality of life.

However, the majority of patients (62%) considered home iontophoresis to be "much less effective" than hospital treatment. Notably, 92% of patients used a lower electrical current during home iontophoresis compared to the current they tolerated during hospital therapy delivered by a nurse. Furthermore, 46% of individuals were no longer using their home iontophoresis machine because it was not effective for their hyperhidrosis. This group had used home iontophoresis for an average of 8 months (range 4–24 months) before discontinuing it, and all individuals applied low currents during home treatment was argued (McAleer and Collins 2014, p. 342).

According to a survey, only 38% of individuals affected by hyperhidrosis have discussed their condition with a healthcare professional. This indicates that a significant proportion of people with hyperhidrosis may not be seeking medical advice or treatment for their condition was argued (Hornberger et al. 2004, p. 276).

CHAPTER- III METHODOLOGY

3.1 Study Design

A Quasi-experimental study was conducted when data was taken after diagnosis, before treatment in the first time, and after completing treatment in the second time. A simple practical questionnaire technique consists of Hyperhidrosis Quality of Life Index (HidroQoL©), Hyperhidrosis Disease Severity Scale (HDSS) was used for routine clinical use in measuring the improvement. The tool was used in both pretest and post-test data collection.

3.2 Study Area and Site

Hyperhidrosis is mainly a dermatological condition. Secondary hyperhidrosis is associate with some neurological and endocrine causes was argued (Walling 2011, P. 690).

Data was taken from the CRP and DCPT by providing equipment and proper research based guideline.

3.3 Study Population

People of any age, sex and region of Bangladesh who had a focal hyperhidrosis and had any kind of impairment of quality of life for this could be the subject of this study.

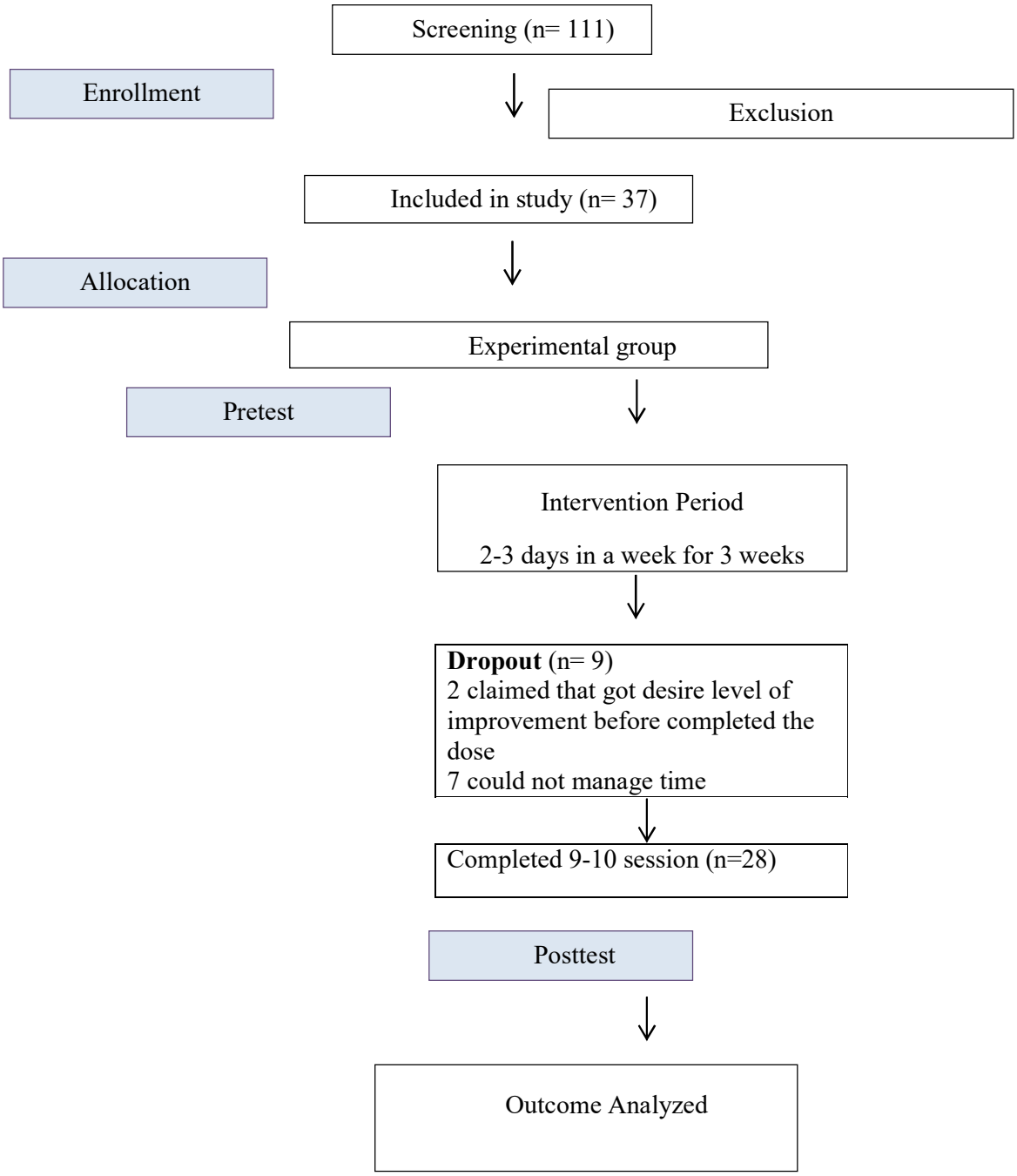
3.4 Sampling Technique

The sampling method utilized in the study was convenient sampling. To obtain the sample, an open form was spread through various social media platforms such as Email, Facebook, and WhatsApp. Additionally, offline poster advertisements were also employed. This combination of online and offline methods allowed for a wider reach and increased the chances of obtaining a diverse sample.

Convenient sampling is a method of selecting participants based on their easy accessibility and availability, rather than using a random or systematic approach. In this case, individuals who came across the open form on social media or noticed the offline posters had the opportunity to voluntarily participate in the study. While this approach is convenient and practical, it may introduce bias and may not accurately represent the entire population, as only certain individuals with specific characteristics or interests are morelikely to participate. As a result, the results obtained through convenient sampling should be interpreted with caution and may not be generalizable to the broader population was argued (Alvi 2016, P. 29).

The use of social media platforms and offline posters served as effective means of recruitment, enabling the researchers to reach a larger pool of potential Participant.

3.5 Intervention Description and Replication (TIDieR) flow chart



3.6 Inclusion criteria

People who have a focal, visible, excessive sweating of at least six month's duration without apparent cause with at least two of the following characteristics were be the sample for the study.

- Bilateral and relatively symmetrical
- Impairs daily activities
- At least one episode a week
- Age of onset less than 25 years
- Positive family history
- Cessation of focal sweating during sleep

Was argued (Hornberger et al. 2004, p. 276).

3.7 Exclusion criteria

People who had excessive sweating onset for flowing reason they were attacked by secondary hyperhidrosis and were excluded from the study.

- Infective: Acute viral or bacterial infections; chronic infections, such as tuberculosis, malaria, brucellosis Drugs: For example, alcohol, cocaine, heroin (including withdrawal), ciprofloxacin, aciclovir, esomeprazole, sertraline, and other antidepressants
- Endocrine: Diabetes, hyperthyroidism, menopause, pregnancy, carcinoid syndrome, hyperpituitarism, pheochromocytoma, acromegaly
- Neurological disorders: Stroke, spinal cord injuries, gustatory sweating after parotidectomy, Parkinson's disease
- Other: Lymphoma and other myeloproliferative disorders, congestive heart failure, anxiety and obesity

Was argued (Benson et al. 2013, p. 1).

3.8 Piloting

A piloting was done with three patients to find out the error and obstacles of the device, to khow if the patients have any problems to understand the process and there is any fear to take the treatment. Fear about current application is common for all patients. Firstly, wet towel was kept on electrical plates. The towel must not touch each other. The reason of this eclectic current has the tendency to move into the short path. When the towel has been touch with each other current has passed through the towel and enough current has not passed through the hand. One hand has to keep on both towel thus current can pass from one hand to another. A treatment session has taken a total of 30 minutes. A form of alternative current was applied to patient's hand.

Patients had to take 9-10 session for appropriate outcome. Two patient from three could complete full session and a batter outcome was founded. Both of their swatting reduces and they didn't felt any disturbance. Once there was a gap of taking therapy they need phone call for continuation of treatment. Another patient was denied to take treatment after three sessions. Patient told that is was very time timed process and he can't have much time for this.

3.9 Data collection tools

For collecting data, some materials were used. Tools or materials that were used for data collection are-

- Questioner consists of consent form, some subjective question, diagnostic question for hyperhidrosis and the Hyperhidrosis Disease Severity Scale (HDSS).
- Pencil.
- Extra pad if there is something have to note.
- Clip board.
- Elements for Starch combined with elemental iodine test for confirmatory improvement measurement test.

3.10 Data Collection

An open call was initiated across various social media platforms, including email, Facebook, and WhatsApp, with the aim of collecting a diverse range of samples. A meticulously designed form, equipped with a set of fundamental questions to conduct primary screening for hyperhidrosis, was created. This form was made available to interested individuals, allowing them to share their experiences and relevant information. The response to this outreach exceeded expectations, with over 200 individuals eagerly filling out the form to participate in the study.

Upon receiving the submissions, a careful evaluation was conducted to determine the participants who met the predetermined inclusion criteria. Those who were promptly contacted, extending invitation was done to them for take a part in the research. This personal outreach not only facilitated engagement but also appreciated for their willingness to contribute to the study.

By using the social media, the study successfully reached a wide audience, attracting a substantial number of respondents. The utilization of an inclusive and accessible platform ensured a diverse pool of participants, fostering a comprehensive understanding of hyperhidrosis.

This approach to participant recruitment not only promoted inclusivity but also demonstrated a commitment to exploring the topic of hyperhidrosis from multiple perspectives. The response from the participants highlights their desire to contribute in the research.

The recommended criteria for establishing the diagnosis of primary focal hyperhidrosis include the following:

-Sweating generally occurs in both sides in same time.
-Hampers daily activities.
-Occurs at list once in a week.
-Age of onset less than 25 years.
-Have previous occurrence in family.
-No problematic or abnormal sweating during sleeping was argued (Hornberger et al. 2004, p. 276).

Indeed, a safe subjective test called the iodine-starch test is commonly used to visualize the severity of excessive sweating, particularly in cases of primary focal hyperhidrosis. The test involves applying a mixture of starch (a polysaccharide) and elemental iodine (I2, brown) to the areas of the body affected by excessive sweating. When this mixture comes into contact with water or sweat, it forms a distinct blue-black precipitate, making the sweating patterns more visible.

For this test, the most effective iodine source is typically a solution of 3.5% iodine in alcohol. However, some sources have also suggested using a 1% povidone-iodine solution for the same purpose. Both solutions can produce similar results in visualizing the excessive sweating areas, helping healthcare professionals to assess the severity and extent of the hyperhidrosis.

It's important to note that this test is subjective and does not provide precise quantitative measurements of sweat production. It is primarily used as a visual aid to assist in diagnosing and evaluating the extent of hyperhidrosis in a safe and non-invasive manner was argued (Swinehart 20009. p. 393).

It’s also calls Minor’s Starch-iodine test.

The process involves putting Iodin solution on a clean, dry inspection location and letting it air dry. Then a cotton ball is used to delicately apply cornstarch powder. When you sweat, blue black spots appear was argued (Swinehart 20009. p. 394).

Test area is measured with a double square lattice grid with a “grid constant” of 1 **cm^2** was argued (Bahmer and Sachse 2008, p.1744).

The sample was obtained by conducting poster campaigns in different places. Special attention was given to ensuring that the poster was easily understandable by people. Individuals who reached out the researcher were diagnosed, and their consent for treatment was obtained to participate the research.

3.11 Improvement measurement tools

The following measurement tools were used to measure the improvement before and after treatment. The measurement was taken before and once after patient has completed 9-10 session. A subjective test calls Minor's Starch-iodine test was done and measure the Grid constant by **cm^2** before and after intervention.

Other two objective scales were used to know patient's satisfaction. One is the severity scale for hyperhidrosis disease. A 4-point scale called the HDSS was created to gauge the severity of primary hyperhidrosis. The HDSS application can be made by the patient or by an interviewer. The HDSS gauges a patient's severity depending on how much their everyday activities are affected by excessive sweating was argued (Kowalski et al. 2004, p. P51).

The four statements are in below:

1. My sweating is never noticeable and never interferes with my daily activities - Mild
2. My sweating is tolerable but sometimes interferes with my daily activities - Moderate
3. My sweating is barely tolerable and frequently interferes with my daily activities - Severe
4. My sweating is intolerable and always interferes with my daily activities - Severe

Another objective Scale is The Hyperhidrosis Quality of Life Index (HidroQoL).

Specifically, for assessing the quality of life of persons with hyperhidrosis, the Hyperhidrosis Quality of Life Index (HidroQoL) is a validated measure was argued (Gabes et al. 2021, P. 473).

It does consist of twenty question within four different domains. The domains are:

1. Functional/ Social Domain
2. Personal Domain
3. Emotional Domain
4. Under Special Circumstance

Each item has five response options before treatment (Excellent = 1; Very good = 2; Good = 3; Poor/Inferior = 4; Very poor/Inferior = 5) and five response options after treatment (Much better = 1; Slightly better = 2; The same = 3; Slightly worse = 4;

Much worse = 5). The interpretation is before Treatment (20Excellent- 100 Very poor/Inferior) and after Treatment (20- Much Better – 100 Much Worse).

3.12 Analysis

The data analysis mainly involved the transcripts of the interviews, with themes being identified and incorporated into the next stage of data collection. The participants were asked the same questions by using a prepared semi-structured questionnaire. The questions were analyzed as the first step in data analysis. For a more comprehensive analysis, the individual responses were read thoroughly several times to identify the actual meanings and themes within the responses. Finally, the themes within each category were determined. The statistical analysis was conducted using two software tools: Statistical Package for Social Sciences (SPSS) version 20 and Microsoft Excel version 2019. The significance level for the statistical tests was set at $P < 0.05$.

3.13 Ethical Considerations

Researchers had an ethical responsibility to recognize and protect the rights of human research participants. Human rights that required protection in research were the right to self-determination, right to privacy, right to anonymity and confidentiality, right to fair treatment, and protection from discomfort and harm (The British Psychological Society, 2010). These five principles of human rights were considered for this research. The ways of protecting the five human rights were divided into three parts: before, during, and after data collection. Before data collection, the researchers sought approval from the Review committee of BHPI. Once approval was obtained, the research process began. Participants were provided with detailed information to protect the five human rights as described in the consent form. This information included a thorough description of the purpose and procedure of the research, the benefits, and the risks of participating in the research. Participants had the right to decide whether to participate and could withdraw from the research at any time. Their decision not to participate did not impact the quantity and quality of care for their family member from the therapy team. All collected information was kept confidential, and only the researcher had access to the data. Data collected were not disclosed or identified with an individual's name.

After data collection, all data were transcribed and entered into one computer and two backup copies were made onto portable hard drives. Printed or raw data were locked in a file box, and only the researcher had access to these data. The data were deleted, shredded, and discarded after the research was completed. The research proposal was submitted to the ethical committee, Institutional Review Board (IRB), and efforts were made to obtain approval from the Board Bangladesh Medical Research Council (BMRC). The guidelines of the World Health Organization (WHO) were also followed to conduct the study.

CHAPTER- IV RESULTS

4.1 Age range of the participants (n=28)

The chart shows information about the age distribution of the 28 participants. The average age of the participants was 24.07 years with a standard deviation of 3.76 years. The participants' ages ranged from 18 to 50 years, with the youngest participant being 20 years old and the oldest being 37 years old.

Figure 1 illustrates the specific age distribution of the participants. Among the 28 participants, 10 individuals (35.70%) were 23 years old, 4 participants (14.30%) were 20 years old, and 3 participants (10.70%) were 24 years old. There were 2 participants each who were aged 21, 25, 26, and 31 years. Additionally, there was 1 participant each who was aged 22, 27, and 37 years.

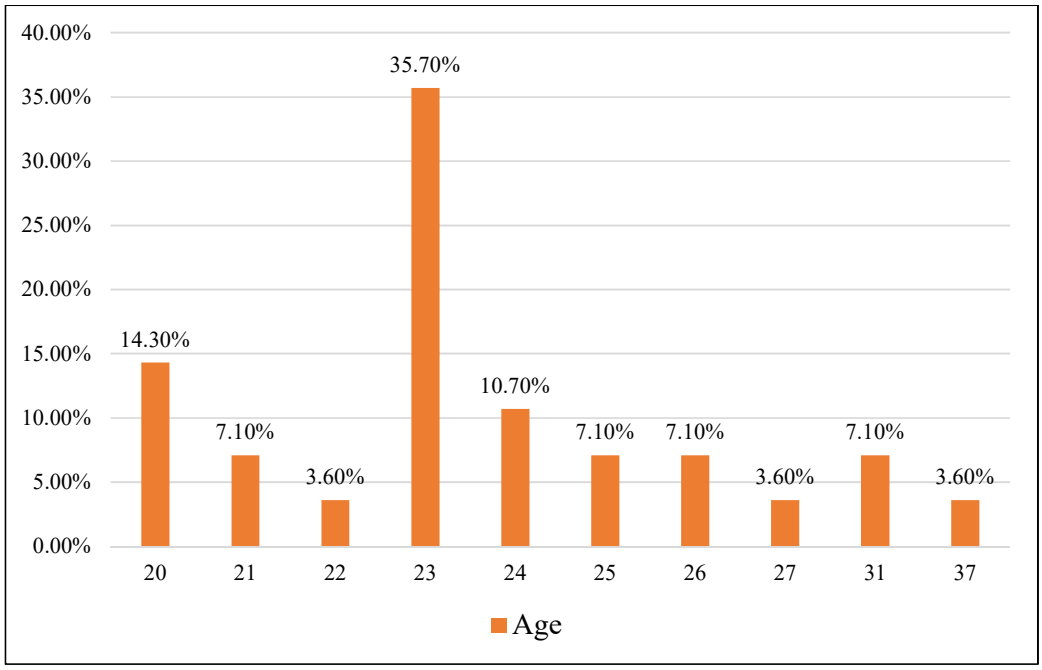


Figure 1: Age of the participants

4.2 Gender of the participants (n= 28)

According to the chart, out of the 28 participants, 75% (n=21) were male, and 25% (n=7) were female.

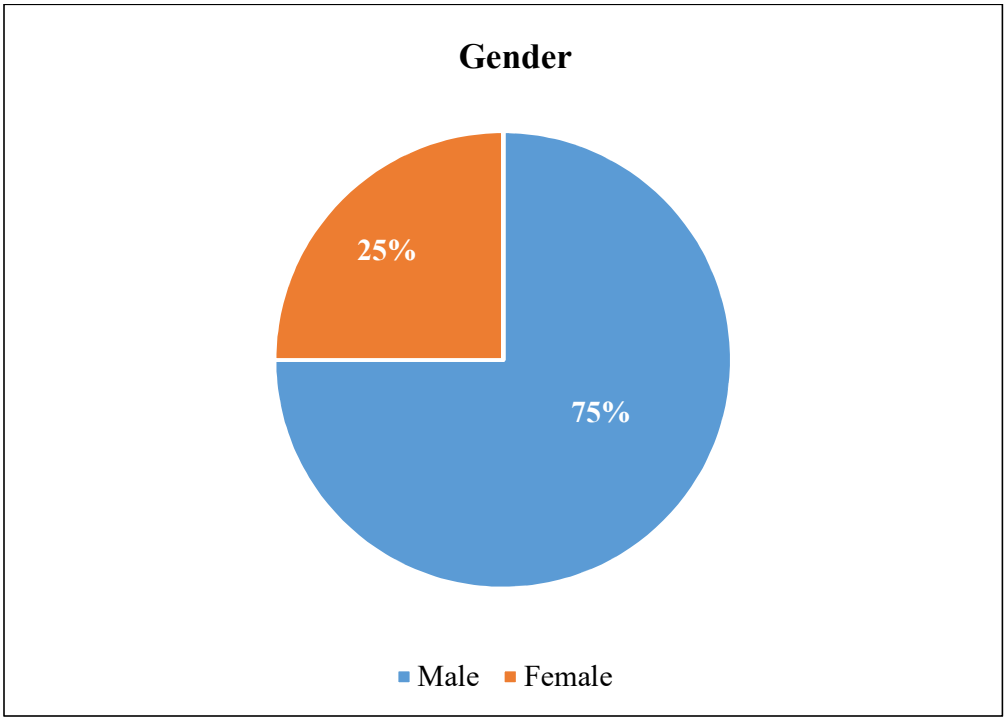


Figure 2: Gender of the participants

4.3 Occupational status of the participants (n=28)

The chart shows that among the 28 participants, 75.0% (n= 21) participants were students, 3.6% (n= 1) participants were physiotherapist, 7.1% (n= 2) participants were housewife, 10.7% (n=3) participants were worker and 3.6% (n=1) participants were rickshaw puller.

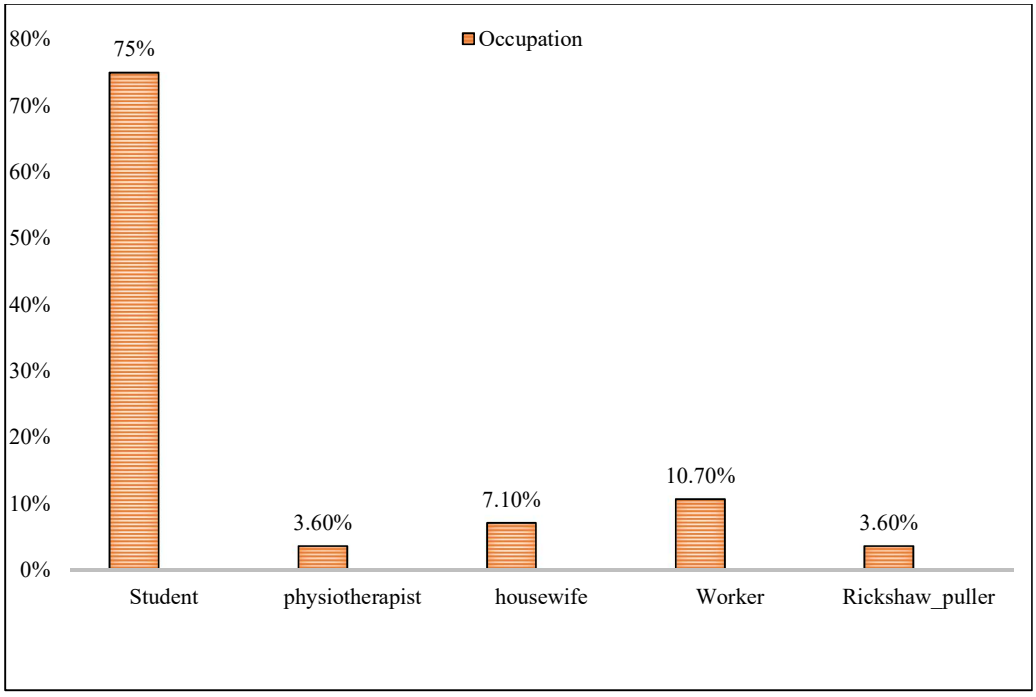


Figure 3: Occupational status of the participants

4.4 Participants number and parentage meet up of diagnostic criteria

100% (n= 28) participants had a visible sweating in their palm. From them 92.9% (n= 26) had the sweating generally in both sides in same time. 85.7% (n= 24) participants agreed with the statement that the sweating hampers their daily activities. 96.4% (n= 27) participant's sweating occurred once a week. From the participants 92.9% (n= 26) has their age less than 25 years. 67.9% (n= 19) had previous occurrence of sweating in family members. 14.3% (n=4) had abnormal sweating during sleeping.

Criteria	Friquency		Percent	
	Yes	No	Yes	No
Visible Sweating	28	0	100%	0%
Both Hand Sweating	26	2	92.9%	7.1%
Hampers Daily Actives	24	4	85.7%	14.3%
Once in a week	27	1	96.4%	3.6%
Age less than 25	26	2	92.9%	7.1%
Sweating in family members	19	9	67.9%	14.3%
Sweating during sleeping	4	24	14.3%	85.7%

Table 1: Patients responses according to diagnostic criteria

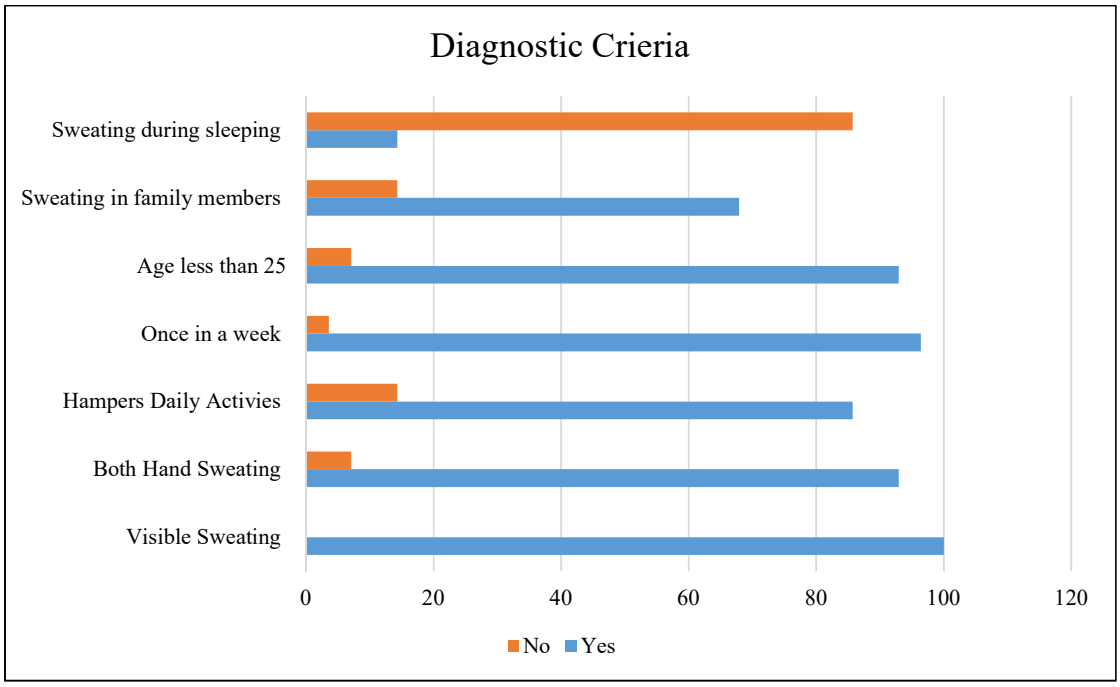


Figure 4: Participants according to diagnostic criteria

4.5 Result of Pre-test and post-test according to Hyperhidrosis Disease Severity Scale (HDSS)

Paired Samples Test

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	HDSS_score_before - HDSS_score_after	1.464	.576	.109	1.241	1.688	13.447	27	.000

Table 2: Result of Pre-test and post-test according to HDSS

The result indicates that there is a significant positive relationship between using iontophoresis and reducing HDSS score. This conclusion is based on the following findings: the standard deviation is 0.576, the t-value is 13.447, and the p-value is 0.00, which is less than the significance level of 0.05. Therefore, we reject the null hypothesis (Ho) and accept the alternative hypothesis (Ha).

4.6 Result of Pre-test and post-test on the basis of Minors Starch-iodine test

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	right_hand_grid_measurement_before - right_hand_grid_measurement_after	27.679	23.330	4.409	18.632	36.725	6.278	27	.000
Pair 1	left_hand_grid_measurement_before - left_hand_grid_measurement_after	31.893	24.615	4.652	22.348	41.437	6.856	27	.000

Table 3: Result of Pre-test and post-test on the basis of Minors Starch-iodine test

The findings suggest a significant positive relationship between using iontophoresis and reducing the Minors Starch-iodine test score. The results indicate that the standard deviation is 23.330 for the right hand and 24.615 for the left hand. The t-values are 6.278 for the right hand and 6.856 for the left hand. Additionally, the p-values for both hands are 0.00, which is lower than the significance level of 0.05. Therefore, we can reject the null hypothesis (Ho) and accept the alternative hypothesis (Ha).

4.7 Result of Pre-test and post-test according to Hyperhidrosis Quality of Life Index (HidroQoL©)

With relation to the writing, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Writing_before - HidroQoL_Writing_after	1.750	.585	15.821	27	.000

Table 4: Intervention result related to writing

There is a significant positive relationship between using iontophoresis and Quality of Life with relation to the writing. This conclusion is based on the t-value is 15.821, and the p-value is 0.00, which is less than the significance level of 0.05.

With relation to manual work, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Manual_work_before - HidroQoL_Manual_work_after	1.893	.567	17.667	27	.000

Table 5: Intervention result related to manual work

There is a significant positive relationship between using iontophoresis and Quality of Life with relation to manual work. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

With relation to leisure, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Leisure_before - HidroQoL_Leisure_after	1.464	.637	12.159	27	.000

Table 6: Intervention result related to leisure

There is a significant positive relationship between using iontophoresis and Quality of Life with relation to leisure. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

With relation to sports, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Sports_before - HidroQoL_Sports_after	1.857	.651	15.105	27	.000

Table 7: Intervention result related to sports

There is a significant positive relationship between using iontophoresis and Quality of Life with relation to the sports. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

With relation to hand shaking, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Hand_shaking_before - HidroQoL_Hand_shaking_after	1.643	.678	12.813	27	.000

Table 8: Intervention result related to hand shaking

There is a significant positive relationship between using iontophoresis and Quality of Life with relation to hand shaking. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

With relation to socializing (public place), the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Socialization_before - HidroQoL_Socialization_after	1.821	.772	12.479	27	.000

Table 9: Intervention result related to socializing

There is a significant positive relationship between using iontophoresis and Quality of Life with relation to socializing (public place). This conclusion is based on the t-value is 12.879, and the p-value is 0.00, which is less than the significance level of 0.05.

With relation to grasping object, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Grasping_object_before - HidroQoL_Grasping_object_after	1.964	.693	15.000	27	.000

Table 10: Intervention result related to grasping object

There is a significant positive relationship between using iontophoresis and Quality of Life with relation to grasping object. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

With relation to social gathering, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Social_gathering_before - HidroQoL_Social_gathering_after	1.929	.766	13.316	27	.000

Table 11: Intervention result related to social gathering

There is a significant positive relationship between using iontophoresis and Quality of Life with relation to social gathering. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

With relation to holding hands of partner/spouse, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Holding_hands_before - HidroQoL_Holding_hands_after	1.875	.835	6.355	7	.000

Table 12: Intervention result related to holding hands of partner

There is a significant positive relationship between using iontophoresis and Quality of Life with relation holding hands of partner/spouse. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

With relation to intimate touching with partner/spouse, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Intimate_touching_before - HidroQoL_Intimate_touching_after	1.750	.886	5.584	7	.001

Table 13: Intervention result related to intimate touching with partner

There is a significant positive relationship between using iontophoresis and Quality of Life with relation to intimate touching with partner/spouse. This conclusion is based on the p-value is 0.01, which is less than the significance level of 0.05.

With relation to intimate affairs with partner/spouse, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Intimate_affairs_before - HidroQoL_Intimate_affairs_after	1.875	.991	5.351	7	.001

Table 14: Intervention result related to intimate affairs with partner

There is a significant positive relationship between using iontophoresis and Quality of Life with relation to intimate affairs with partner/spouse. This conclusion is based on the p-value is 0.01, which is less than the significance level of 0.05.

Participants always justify themselves, rating of the fact before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	T	df	Sig. (2-tailed)
Pair 1	HidroQoL_Justified_myself_before - HidroQoL_Justified_myself_after	1.893	.629	15.927	27	.000

Table 15: Intervention result of rating the fact participants always justify themselves

The condition Quality of Life with relation to participants always justify themselves was improved by using iontophoresis. This conclusion is based on the p-value is 0.01, which is less than the significance level of 0.05.

People rejected the participant, rating of the fact before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_People_rejected_before - HidroQoL_People_rejected_after	1.929	.766	13.316	27	.000

Table 16: Intervention result of rating the fact people rejected the participant

The condition Quality of Life with relation to people rejected the participant was improved by using iontophoresis. This conclusion is based on the p-value is 0.01, which is less than the significance level of 0.05.

In a closed or hot environment, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Closed_hot_environment_before - HidroQoL_Closed_hot_environment_after	2.071	.604	18.141	27	.000

Table 17: Intervention result of rate participant's quality of life in a closed or hot environment

There is a significant positive relationship between using iontophoresis and quality of life with relation to the in a closed or hot environment. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

When tense or worried, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Tense_worried_before - HidroQoL_Tense_worried_after	2.250	.645	18.445	27	.000

Table 18: Intervention result of rate participant's quality of life when tense or worried

There is a significant positive relationship between using iontophoresis and quality of life with relation to when tense or worried. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

Thinking about the problem, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Thinking_about_problem_before - HidroQoL_Thinking_about_problem_after	1.964	.693	15.000	27	.000

Table 19: Intervention result of rate participant's quality of life when thinking about the problem

The result indicates that there is a significant positive relationship between using iontophoresis and quality of life with relation to thinking about the problem. This conclusion is based on the t-value is 15.000, and the p-value is 0.00, which is less than the significance level of 0.05.

Before an examination/meeting/speaking in public, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Before_examination_etc_before - HidroQoL_Before_examination_etc_after	1.893	.786	12.744	27	.000

Table 20: Intervention result of rate participant's quality of life before an examination/meeting/speaking in public

There is a significant positive relationship between using iontophoresis and quality of life with relation to before an examination/meeting/speaking in public. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

Wearing sandals /walking barefoot, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2- tailed)
Pair 1	HidroQoL_Wearing_sandals_before - HidroQoL_Wearing_sandals_after	.714	.659	5.738	27	.000

Table 21: Intervention result of rate participants quality of life when wearing sandals /walking barefoot

There is a significant positive relationship between using iontophoresis and quality of life with relation to wearing sandals /walking barefoot. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

Wearing colored clothing, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Wearing_clothing_before - HidroQoL_Wearing_clothing_after	1.071	.716	7.914	27	.000

Table 22: Intervention result of rate participants quality of life when wearing colored clothing

There is a significant positive relationship between using iontophoresis and quality of life relation to wearing colored clothing. This conclusion is based on the p-value is 0.00, which is less than the significance level of 0.05.

Having problems at school/work, the participants rate their quality of life before and after the treatment

Paired Samples Test						
		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	HidroQoL_Problems_at_work_before - HidroQoL_Problems_at_work_after	1.964	.793	13.113	27	.000

Table 23: Intervention result of rate participant's quality of life when having problems at school/work

The result indicates that there is a significant positive relationship between using iontophoresis and Quality of Life with relation having problems at school/work. This conclusion is based on p-value is 0.00, which is less than the significance level of 0.05.

Total Hyperhidrosis Quality of Life Index (HidroQoL©) difference before and after

Paired Samples Test

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Total_HidroQoL_before - Total_HidroQoL_after	1.786	.630	.119	1.541	2.030	15.000	27	.000

Table 24: Total HidroQoL© difference before and after

The result indicates that there is a significant positive relationship between using iontophoresis and total Quality of Life. This conclusion is based on the following findings: the standard deviation is 0.630, the t-value is 15.000, and the p-value is 0.00, which is less than the significance level of 0.05. Therefore, we reject the null hypothesis (Ho) and accept the alternative hypothesis (Ha).

CHAPTER-V DISCUSSION

5.1 Discussion

In this study, the age range of participants was from 20 to 37 years, and no significant impact was observed in relation to age. Iontophoresis demonstrated an equal effect across the age group of 20-37 years. Interestingly, no other study has been found that indicates any age-specific effect within the 20-37 age range concerning improvements achieved through iontophoresis. These findings highlight the consistent and promising outcomes of iontophoresis regardless of age in this particular age bracket. Among the 28 patients, 75% were male, and 25% were female. Interestingly, no significant difference was found between males and females in terms of improvement achieved through iontophoresis. Furthermore, no other study has been discovered that indicates any gender-specific effects. These findings underscore the consistent and promising outcomes of iontophoresis regardless of gender within this specific patient group. The primary objective of this study is to investigate the effectiveness of iontophoresis as a treatment for primary focal hyperhidrosis. In addition, the research aims to evaluate the participants' quality of life and examine individual changes in their condition before and after undergoing the treatment. In this section, we will thoroughly discuss the results and findings of the study and draw connections to relevant previous research conducted in this field.

The results of the study revealed that the quality of life for individual participants improved after the post-test compared to the pre-test. Moreover, the T-test analysis demonstrated a significant and positive correlation between using iontophoresis and reducing hyperhidrosis. These findings suggest that iontophoresis is effective in improving participants' quality of life and reducing the symptoms of hyperhidrosis. Karakoc et al. (2002) conducted a controlled trial involving 112 patients diagnosed with palmer hyperhidrosis. The study revealed that after 8 treatments, there was an impressive 81.2% reduction in sweating compared to the baseline measurement. This reduction became noticeable 20 days after the eighth treatment. However, it is important to note that, on average, symptoms began to return after approximately 35 days following the treatment. These findings indicate the potential effectiveness of the treatment in managing palmer hyperhidrosis, although the duration of the effect may vary from person to person.

The primary objective of this study was to examine and analyze the variations in the quality of life experienced by individuals before and after undergoing the intervention. To monitor and assess the progress in their quality of life, the researchers utilized the Hyperhidrosis Quality of Life Index (HidroQoL©) at multiple points: before the intervention, during the intervention, and after the intervention. The intervention itself spanned across duration of four weeks, with participants engaging in approximately three sessions per week. The results obtained from the study provided compelling evidence that the implemented program had a substantial effect in reducing excessive sweating among the participants. Notably, this reduction in sweat production was accompanied by a considerable improvement in their overall quality of life. These outcomes demonstrate the effectiveness of the intervention in addressing hyperhidrosis and its positive influence on the participants' well-being and daily experiences.

A RCT was done by Kouhsari et. al. (2014) to compair the improvement of excessive sweating by using iontophoresis and intradermal injection. In the study, researchers compared two treatments, BTX-A injection and iontophoresis, for axila in a randomized controlled trial. They wanted to find out which treatment worked better for patients with this condition. Eleven patients diagnosed with axiallary hyperhidrosis participated. Each patient had one armpit randomly treated with 1.5 mL (250 MU) of BTX-A through injections, while the other armpit received BTX-A through iontophoresis. The researchers measured sweating, skin hydration, transepidermal water loss, pain levels, and patient satisfaction for both armpits at the start of the study (baseline) and compared them to the measurements taken one week, one month, and six months after treatment. The results showed that the side treated with injections had a significantly lower amount of sweat production compared to the side treated with iontophoresis. But the response to iontophoresis was more consistent and stable compared to the response from injections. Additionally, participants reported significantly less pain during the procedure when receiving iontophoresis treatment compared to the injection side.

Gabes et al (2020) to maesure the validation of Hyperhidrosis Quality of Life Index (HidroQoL©) for axilary hyperhidrosis. The researchers utilized data from a phase III randomized placebo-controlled clinical trial. They conducted confirmatory factor analysis to validate the pre-established two-factor structure of the HidroQoL. To

assess convergent validity, they examined correlations between the HidroQoL and other scales, including the Dermatology Life Quality Index (DLQI), the Hyperhidrosis Disease Severity Scale (HDSS), and gravimetric sweat production. To evaluate discriminative validity, known groups were analyzed. Additionally, the researchers assessed responsiveness after 29 days of intervention. To determine the minimal important difference (MID) values, they used both anchor- and distribution-based approaches. All these analyses were conducted for the total HidroQoL and its two domains. The study confirmed the presence of the two-factor structure of the HidroQoL. The internal consistency and test-retest reliability of the questionnaire were found to be strong and reliable.

In this study, a positive improvement of the condition was clearly demonstrated. However, it is worth noting that the focus of the current study was directed towards patients with axillary hyperhidrosis, whereas our study was conducted specifically to address palmer hyperhidrosis. As such, the comparison between the two studies highlights the distinction in patient groups and the targeted areas of investigation, thereby contributing valuable insights to the field of hyperhidrosis research.

In their study Varella et al (2016) evaluated symptoms related to palmer and axillary hyperhidrosis. Patients were allowed to indicate different site-specific HDSS scores based on the impact of excessive sweating on their quality of life in each area. The patients completed this scale twice: once during the initial appointment (before starting treatment, week 0) and again at the end of the five-week treatment.

In the HDSS scale, a response graded indicated no perceptible sweating and no interference in everyday life. Grade 2 meant tolerable sweating with occasional interference in everyday life. Grade 3 indicated slightly tolerable sweating with frequent interference in everyday life. Finally, grade 4 represented intolerable sweating with constant interference in everyday life.

As a foundational study in Bangladesh, our findings further confirm that HDSS is a straightforward and expeditious tool for conducting evaluations, aligning with its widespread utilization on a global scale. The efficacy and simplicity of HDSS make it a valuable resource in assessing hyperhidrosis, providing researchers and healthcare practitioners with a reliable and efficient method to gather essential data for evaluation purposes in this region and beyond.

5.2 Limitations

Hyperhidrosis is not widely recognized as a prevalent condition in Bangladesh, and it has not been acknowledged as a disease in this region. Moreover, many individuals who suffer from hyperhidrosis tend to keep their struggles private, leading to difficulties in obtaining an adequate sample size for research. The lack of awareness and belief in the treatability of hyperhidrosis often poses challenges for researchers to motivate patients to participate and continue with the treatment.

In some cases, the sample size is further reduced because a few sufferers experience milder cases of hyperhidrosis and are successfully cured with fewer treatment sessions than expected. These instances can impact the research outcome, making it essential for researchers to carefully manage and address these variations in the data collection process. Despite these challenges, dedicated efforts and patient education are necessary to raise awareness about hyperhidrosis as a treatable condition, encouraging more individuals to participate in research studies and avail themselves of effective treatments. Due to a lack of widespread awareness and proper knowledge about hyperhidrosis at the mass level, it was challenging to include people of all ages and occupations in the study. Additionally, the sample could not be drawn blindly from all regions due to the limited understanding of hyperhidrosis and its implications.

Furthermore, the intervention was applied only in two centers, which primarily catered to a large number of student participants. This limitation in the selection of centers might have impacted the diversity of the sample. Despite these challenges, efforts were made to conduct the research within the available resources and settings to gain valuable insights into hyperhidrosis and its treatment.

CHAPTER- VI CONCLUSION AND RECOMENDATION

6.1 Conclusion

The education rate in Bangladesh is a matter of concern as it remains notably low. Moreover, the healthcare services provided by both government and non-government sectors are not sufficiently meeting the needs of the population. Presently, the government health policy is struggling to keep up with the demands of the people. Although private clinics and hospitals are striving to introduce modern medical services in the country, the available healthcare facilities are still unable to adequately address the basic health issues faced by the citizensIn this challenging situation, one health condition that tends to be overlooked is hyperhidrosis, primarily because it is not considered life-threatening. As a result, individuals suffering from hyperhidrosis are often reluctant to share their concerns with others or even with healthcare service providers. However, despite not being life-threatening, hyperhidrosis has a considerable impact on the mental health and overall quality of life of those affected.

Fortunately, there is a potential solution in the form of iontophoresis, which has shown promising results in reducing sweating for participants. By effectively addressing hyperhidrosis, this treatment helps mitigate the negative impact on the quality of life experienced by those with the condition. The availability and successful application of iontophoresis offer hope for improved well-being and comfort for individuals dealing with hyperhidrosis in Bangladesh. In the study the main challenge was consistency. The complete intervention required 9-10 sessions, with each session lasting 30 minutes. If a sufferer did not experience any improvement after one or two sessions, they became demotivated. Sustaining participant motivation throughout the intervention was a significant obstacle to overcome. Despite these challenges, a total of 28 participants managed to complete the full intervention dose, and the results were positive according to all three scales used for evaluation.

6.2 Recommendation

Based on the best available knowledge, there has been no specific study conducted on hyperhidrosis in Bangladesh, indicating a significant gap in research on this topic. Consequently, there exists a vast scope to explore and work on this medical condition in the country. Several potential avenues for research and study in the field of hyperhidrosis can be pursued. To begin with, prevalence studies can be undertaken to determine the extent of hyperhidrosis among the population in Bangladesh. An epidemiological study can provide valuable insights into the distribution and risk factors associated with the condition, contributing to a better understanding of its impact on public health.

Moreover, medical practitioners, particularly dermatologists, can actively participate in experimenting with various treatment methods for hyperhidrosis. Conducting experiments, clinical trials, or randomized controlled trials (RCTs) can be an effective approach to assess the efficacy and safety of different treatments. For example, comparing the outcomes of medication-based approaches with iontophoresis can shed light on the most suitable treatment options for patients. Additionally, a cohort study can be undertaken to examine the rate of recurrence of hyperhidrosis after patients have completed their treatment. Understanding the duration and likelihood of recurrence can help healthcare providers and patients make more informed decisions regarding long-term management strategies.

Overall, by initiating these research initiatives, Bangladeshi researcher can pave the way for advancements in hyperhidrosis treatment and management, benefiting both medical professionals and individuals affected by the condition.

CHAPTER- VII REFERENCE

- Alvi, M 2016, 'A manual for selecting sampling techniques in research', <https://mpra.ub.uni-muenchen.de/70218/>.
- Bahmer, FA & Sachse, MM 2008, 'Hyperhidrosis area and severity index', *Dermatologic Surgery'*, *34*(12), pp.1744-1745, <https://journals.lww.com/dermatologicsurgery/Citation/2008/12000/Hyperhidrosis_Area_and_Severity_Index.26.aspx>.
- Benson, RA, Palin, R, Holt, PJE & Loftus, IM 2013, 'Diagnosis and management of hyperhidrosis', *Bmj*, 347, < https://www.bmj.com/content/347/bmj.f6800.full >.
- D. M. Baker, 2016, "Topical glycopyrrolate reduces axillary hyperhidrosis", *Journal of the European Academy of Dermatology & Venereology*, Vol.30; Issue: 12, <https://doi.org/10.1111/jdv.13745>.
- Dolianitis, C, Scarff, CE, Kelly, J & Sinclair, R 2004, 'Iontophoresis with glycopyrrolate for the treatment of palmoplantar hyperhidrosis', *Australasian journal of dermatology*, *45*(4), pp. 208-212, < https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1440-0960.2004.00098.x >.
- Gabes, M, Jourdan, C, Schramm, K, Masur, C, Abels, C, Kamudoni, P, ... & Apfelbacher, C 2021, "Hyperhidrosis Quality of Life Index (HidroQoL©): further validation and clinical application in patients with axillary hyperhidrosis using data from a phase III randomized controlled trial", *British Journal of Dermatology*, *184*(3), 473-481, <https://academic.oup.com/bjd/article/184/3/473/6702235>.
- Guy, RH, Kalia, YN, Delgado-Charro, MB, Merino, V, López, A, & Marro, D 2000, "Iontophoresis: electrorepulsion and electroosmosis", *Journal of controlled release*, *64*(1-3), 129-132, < https://www.sciencedirect.com/science/article/abs/pii/S0168365999001327>.
- Hornberger, J, Grimes, K, Naumann, M, Glaser, DA, Lowe, NJ, Naver, H, Ahn, S & Stolman, LP 2004, 'Recognition, diagnosis, and treatment of primary focal hyperhidrosis', *Journal of the American Academy of*

Dermatology, *51*(2), pp. 274-286, < https://www.jaad.org/article/s0190-9622(04)00515-8/fulltext >.

- Karakoç, Y, Aydemir, EH, Kalkan, MT, & Ünal, G 2002, "Safe control of palmoplantar hyperhidrosis with direct electrical current", *International journal of dermatology*, 41(9), 602-605, < https://onlinelibrary.wiley.com/doi/abs/10.1046/j.1365-4362.2002.01473.x >.
- Kowalski, JW, Eadie, N, Dagget, S & Lai, PY, 2004, "Validity and reliability of the hyperhidrosis disease severity scale (HDSS)", *Journal of the American Academy of Dermatology*, *50*(3), p.P51, <https://www.jaad.org/article/S0190-9622(03)03534-5/fulltext>
- Lear, W, Kessler, E, Solish, N & Glaser, DA, 2007, 'An epidemiological study of hyperhidrosis', *Dermatologic surgery*, *33*, pp. S69-S75, < https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1524-4725.2006.32334.x >.
- Loo, WJ, Diba, V, Chawla, M, & Finlay, AY 2003, "Dermatology Life Quality Index: influence of an illustrated version", *British Journal of Dermatology*, *148*(2), 279-284, < https://doi.org/10.1046/j.1365-2133.2003.05158.x>.
- McAleer, MA & Collins, P 2014, 'A study investigating patients' experience of hospital and home iontophoresis for hyperhidrosis', *Journal of dermatological treatment*, *25*(4), pp. 342-344, < https://www.tandfonline.com/doi/abs/10.3109/09546634.2012.757287?journalCode=ijdt20 >.
- Meena, RL, Kumar, T & Reinai T 2021, "Fentanyl Iontophoresis Can Facilitate Early Physiotherapy in Post-Surgical Acute Pain: A Literature Review", *International Journal of Health Sciences and Research,* Vol.11; Issue: 7, < https://doi.org/10.52403/ijhsr.20210720>.
- Montaser-Kouhsari, L, Zartab, H, Fanian, F, Noorian, N, Sadr, B, Nassiri-Kashani, M, & Firooz, A 2014, "Comparison of intradermal injection with iontophoresis of abobotulinum toxin A for the treatment of primary axillary hyperhidrosis: a randomized, controlled trial", *Journal of dermatological treatment*, *25*(4), 337-341, < https://www.tandfonline.com/doi/full/10.3109/09546634.2012.739679 >

- Moraites, E, Vaughn, OA, & Hill, S 2014, “Incidence and prevalence of hyperhidrosis”, *Dermatologic clinics*, *32*(4), 457-465, <https://www.derm.theclinics.com/article/S0733-8635(14)00073-4/fulltext>.
- Paller, AS, Shah, PR, Silverio, AM, Wagner, A, Chamlin, SL & Mancini, AJ, 2012, “Oral glycopyrrolate as second-line treatment for primary pediatric hyperhidrosis”, *Journal of the American Academy of Dermatology*, *67*(5), 918-923, <https://www.sciencedirect.com/science/article/abs/pii/S0190962212001399 >.
- Paller, AS, Shah, PR, Silverio, AM, Wagner, A, Chamlin, SL, & Mancini, A J, 2012, “Oral glycopyrrolate as second-line treatment for primary pediatric hyperhidrosis”, *Journal of the American Academy of Dermatology*, 67(5), 918-923, < https://www.sciencedirect.com/science/article/abs/pii/S0190962212001399 >
- Pariser, DM, & Ballard, A 2014, “Iontophoresis for palmar and plantar hyperhidrosis”, *Dermatologic clinics*, *32*(4), 491-494, <https://www.derm.theclinics.com/article/S0733-8635(14)00076-X/fulltext>.
- Solish, N, Bertucci, V, Dansereau, A, HONG, HCH, Lynde, C, Lupin, M, Smith, KC & Storwick, G 2007, ‘A comprehensive approach to the recognition, diagnosis, and severity-based treatment of focal hyperhidrosis: recommendations of the Canadian Hyperhidrosis Advisory Committee’, *Dermatologic Surgery*, *33*(8), pp. 908-923, < https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1524-4725.2007.33192.x >
- Solish, N, Wang, R, & Murray, CA 2008, “Evaluating the patient presenting with hyperhidrosis”, *Thoracic surgery clinics*, *18*(2), 133-140, < https://www.sciencedirect.com/science/article/abs/pii/S1547412708000030>.
- Swinehart, JM 2009, ‘Re: Subdermal Nd-YAG Laser for Axillary Hyperhidrosis’, *Dermatologic Surgery*, *35*(6), pp. 1018, <https://journals.lww.com/dermatologicsurgery/Citation/2009/06000/Letter__Re__Subdermal_Nd_YAG_Laser_for_Axillary.25.aspx >.
- Varella, AYM, FUKUDA, J, Teivelis, MP, Campos, JRMD, Kauffman, P, Cucato, GG, ... & Wolosker, N 2016, “Translation and validation of hyperhidrosis disease severity scale”, *Revista da Associação Médica*

Brasileira, *62*, 843-847, < https://www.scielo.br/j/ramb/a/9MsLtNvzL7pQ4fTL9RqqVxx/?lang=en >.

- Wade, R, Jones-Diette, J, Wright, K, Layton, AM, & Woolacott, N 2019, "Hyperhidrosis quality of life measures: review and patient perspective", *Journal of Dermatological Treatment*, *30*(3), 303-308, < https://www.tandfonline.com/doi/full/10.1080/09546634.2018.1506080>.
- Walling, HW 2011, "Clinical differentiation of primary from secondary hyperhidrosis", *Journal of the American Academy of Dermatology*, *64*(4), 690-695, <https://www.sciencedirect.com/science/article/abs/pii/S0190962210003294>.
- Woolery-Lloyd, H, & Valins, W 2009, "Aluminum chloride hexahydrate in a salicylic acid gel: a novel topical agent for hyperhidrosis with decreased irritation", *The Journal of Clinical and Aesthetic Dermatology*, *2*(6), 28, < https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2923959/>.

Annexure-1(A)

Questionnaire

Title: Iontophoresis as a treatment for primary hyperhidrosis: a Quasi-experimental study.

Part I: Socio-demographic Information

Code No: Date:

Patient's name: Address:

Mobile No:

Question	Response
1. Age	……Years ……Months
2. Sex	o Male o Female
3. Occupation	

Part II: Disease Related Information

Code no:

Question	Response
1. Infective	Tick if you currently have any o Tuberculosis o Malaria o Brucellosis o Others- Please mention……..
2. Drugs	Tick if you currently consuming o Alcohol o Cocaine o Heroin (including withdrawal) o Ciprofloxacin o Aciclovir o Any antidepressants o Esomeprazole
3. Endocrine	Tick if you currently have o Diabetes o Hyperthyroidism o Menopause o Pregnancy o Others- Please mention……..
4. Neurological disorders	Tick if you currently have o Stroke o Spinal cord injuries o Parkinson's disease o Others- Please mention……..
5. Other	o Lymphoma o Myeloproliferative disorders o Congestive heart failure o Anxiety o Obesity

Part III: Question based on Diagnosis Criteria

Do you have a visible sweating in your palm? ☐ Yes ☐ No

If yes, from when you feel it? _____ Months/ Year

The following criteria will help us learn more about your condition. Please read the following statements carefully and let me know which are match with you.

1. Sweating generally occurs in both sides in same time. ☐ Yes ☐ No

2. Hampers daily activities. ☐ Yes ☐ No
   If yes, how? _____

3. Occurs at least once in a week. ☐ Yes ☐ No

4. Age of onset less than 25 years. ☐ Yes ☐ No

   If yes, from when? _____

5. Do you have previous occurrence of sweating in family members. ☐ Yes ☐ No

   If yes, mention relationship

_____

6. Any problematic or abnormal sweating during sleeping. ☐ Yes ☐ No

[N.B: If excessive sweating of at least 6 months duration without any secondary cause with at least two of the above mentioned characteristics (2-6) is the diagnosing criteria of hyperhydrosis disease recommended by multi-specialty working group]

Part IV: Improvement measurement tool

Hyperhidrosis Disease Severity Scale (HDSS)

Condition	Score	Clinical interpretation
My sweating is never noticeable and never interferes with my daily activities	1	Mild
My sweating is tolerable but sometimes interferes with my daily activities	2	Moderate
My sweating is barely tolerable and frequently interferes with my daily activities	3	Severe
My sweating is intolerable and always interferes with my daily activities	4	Severe

Score before intervention: Date when measurement taken:

Score after intervention: Date when measurement taken:

Minors Starch-iodine test

	Right Hand	Left Hand	
Grid constant before intervention	**cm^2**	**cm^2**	Date when measurement taken:
Grid constant after intervention	**cm^2**	**cm^2**	Date when measurement taken:

Hyperhidrosis Quality of Life Index (HidroQoL©)

Generally speaking, how would you rate your Quality of Life? Before Treatment?

Excellent	1
Very good	2
Good	3
Poor/Inferior	4
Very poor/Inferior	5

How would you rate your Quality of Life? After Treatment?

Much better	1
Slightly better	2
The same	3
Slightly worse	4
Much worse	5

Compared to the period before treatment,

1) FUNCTIONAL/SOCIAL DOMAIN, with relation to the following items, how would you rate your Quality of Life:

	Before Treatment					**After Treatment**				
Writing	1	2	3	4	5	1	2	3	4	5
Manual work	1	2	3	4	5	1	2	3	4	5
Leisure	1	2	3	4	5	1	2	3	4	5
Sports	1	2	3	4	5	1	2	3	4	5
Hand Shaking	1	2	3	4	5	1	2	3	4	5
Socializing (public place)	1	2	3	4	5	1	2	3	4	5
Grasping objects	1	2	3	4	5	1	2	3	4	5
Social dancing	1	2	3	4	5	1	2	3	4	5

2) PERSONAL DOMAIN, with your partner/spouse. How would you rate your Quality of Life:

	Before Treatment					**After Treatment**				
Holding Hands	1	2	3	4	5	1	2	3	4	5
Intimate touching	1	2	3	4	5	1	2	3	4	5
Intimate affairs	1	2	3	4	5	1	2	3	4	5

3) EMOTIONAL-SELF or OTHERS; how would you rate the fact that after sweating/blushing excessively:

	Before Treatment					**After Treatment**				
I always justified myself	1	2	3	4	5	1	2	3	4	5
People rejected me slightly	1	2	3	4	5	1	2	3	4	5

4) UNDER SPECIAL CIRCUMSTANCES - How would you rate your Quality of Life:

	Before Treatment					**After Treatment**				
In a closed or hot environment	1	2	3	4	5	1	2	3	4	5
When tense or worried	1	2	3	4	5	1	2	3	4	5
Thinking about the problem	1	2	3	4	5	1	2	3	4	5
Before an examination/ meeting/speaking in public	1	2	3	4	5	1	2	3	4	5
Wearing sandals /walking barefoot	1	2	3	4	5	1	2	3	4	5
Wearing colored clothing	1	2	3	4	5	1	2	3	4	5
Having problems at school/work	1	2	3	4	5	1	2	3	4	5

Total Score		

Annexure-1(B)

প্রশ্নপত্র

শিরোনাম : প্রাইমারি হাইপার-হাইড্রোসিস চিকিৎসায় আয়োন্টোফোরোসিসঃ একটি পরীক্ষামূলক গবেষণা।

পার্ট ১: সামাজিক-জনসংখ্যা সংক্রান্ত তথ্য

কোড নং: তারিখ:

রোগীর নাম : ঠিকানা:

ফোন নাম্বার :

প্রশ্ন	উত্তর
১. বয়স	……বছর……মাস
২. লিঙ্গ	○ পুরুষ ○ মহিলা
৩. পেশা	

পার্ট ২: রোগ সম্পর্কিত তথ্য

কোড নং:

প্রশ্ন	উত্তর
১. সংক্রামক রোগ	আপনার বর্তমানে কোনোটি থাকলে টিক দিন ○ টিউবারকিউলোসিস ○ ম্যালেরিয়া ○ ব্রুকেলোসিস ○ অন্যান্য- ……..
২. ঔষধ	আপনি বর্তমানে কোনোটি গ্রহন করলে টিন দিন ○ অ্যালকোহল ○ কোকেন ○ হেরোইন (পূর্বে গ্রহন করলেও) ○ সিপ্রোফ্লক্সাসিন ○ অ্যাসিক্লোভির ○ কোনোরকম এন্টি-ডিপ্রেসেন্ট
৩. এন্ডোক্রাইন সমস্যা	আপনার বর্তমানে কোনোটি থাকলে টিক দিন ○ ডায়াবেটিস ○ হাইপার থাইরয়েডিজম ○ মেনোপজ ○ গর্ভাবস্থা ○ অন্যান্য এন্ডোক্রাইন সমস্যা- ……
৪. স্নায়ুজনিত রোগ	আপনার বর্তমানে কোনোটি থাকলে টিক দিন ○ স্ট্রোক ○ মেরুরজ্জু ইনজুরি ○ পার্কিনসন ডিজিজ ○ অন্যান্য স্নায়ুজনিত রোগ- ……..
৫. অন্যান্য	○ লিম্ফোমা ○ মায়লোপ্রোলিফারেটিভ ডিসওর্ডার ○ হৃদরোগ ○ অতিরিক্ত দুশ্চিন্তা ○ স্থুলতা

পার্ট ৩: রোগ-নির্ণয়কারী বৈশিষ্ট্যভিত্তিক প্রশ্ন

আপনার হাত ঘামা কি দৃশ্যমান? ☐ হ্যা ☐ না

যদি হয়, তাহলে কখন থেকে আপনি এটা অনুভব করছেন?_____ মাস/বছর

নিম্নলিখিত বৈশিষ্ট্যগুলো আমাদেরকে আপনার অবস্থা সম্পর্কে জানতে সাহায্য করবে। নিম্নলিখিত তথ্যগুলো সতর্কতার সাথে পড়ুন এবং আপনার সাথে যেটি মিলে আমাকে বলুন।

১. যখন ঘামে, তখন একসাথে দুইহাত ঘামে। ☐ হ্যা ☐ না

২. দৈনন্দিন কাজকর্মে অসুবিধা হয়। ☐ হ্যা ☐ না
যদি হয়, তাহলে কিরকম?_____

৩. সপ্তাহে কমপক্ষে একবার হয়। ☐ হ্যা ☐ না

৪. এই সমস্যা আমার বয়স পঁচিশ বছর হওয়ার আগে শুরু হয়েছিলো। ☐ হ্যা ☐ না

যদি উত্তর হ্যা হয় তাহলে কত বয়স থেকে?_____

৫. পরিবারের কারো আগে হয়েছিলো। ☐ হ্যা ☐ না

যদি উত্তর হ্যা হয়, আপনার সাথে তার সম্পর্ক_____

৬. ঘুমানোর সময় কি অতিরিক্ত ঘাম হয়? ☐ হ্যা ☐ না

*[**বিশেষ দ্রষ্টব্যঃ** উপরে উল্লিখিত বৈশিষ্ট্যগুলির (১-৬) মধ্যে কমপক্ষে দুটি সহ কোন অতিরিক্ত কারণ ছাড়াই কোনো ব্যাক্তির কমপক্ষে ৬ মাসের অধিক সময় ধরে অতিরিক্ত ঘাম হলে মাল্টি-স্পেশালিটি ওয়ার্কিং গ্রুপের মতে সে প্রাইমারি হাইপার-হাইড্রোসিস রোগে আক্রান্ত]*

পার্ট ৪: উন্নতি পরিমাপক টুল

হাইপারহাইড্রোসিস ডিজিজ সিভিয়ারিটি স্কেল

অবস্থা	স্কোর	ক্লিনিক্যাল ব্যাখ্যা
আমার ঘাম তেমন লক্ষণীয় নয় এবং কখনো দৈনন্দিন কাজকর্মে বাঁধা সৃষ্টি করে না	১	মৃদু
আমার ঘাম সহনীয় এবং এটি মাঝেমধ্যে দৈনন্দিন কাজকর্মে বাঁধা সৃষ্টি করে	২	মাঝারি
আমার ঘাম অতিকষ্টে সহনীয় এবং প্রায়ই এটা আমার দৈনন্দিন কাজকর্মে বাঁধা সৃষ্টি করে	৩	অতিরিক্ত
আমার ঘাম অসহনীয় এবং এটা সবসময়ই আমার দৈনন্দিন কাজকর্মে বাঁধা সৃষ্টি করে	৪	অতিরিক্ত

চিকিৎসার আগে স্কোর:	পরীক্ষার তারিখঃ
চিকিৎসার পরে স্কোর:	পরীক্ষার তারিখঃ

মাইনর'স স্টার্চ-আয়োডিন টেস্ট

	ডান হাত	বাম হাত	
চিকিৎসার আগে গ্রিড ধ্রুবক	বর্গ সেন্টিমিটার	বর্গ সেন্টিমিটার	পরীক্ষার তারিখঃ
চিকিৎসার পরে গ্রিড ধ্রুবক	বর্গ সেন্টিমিটার	বর্গ সেন্টিমিটার	পরীক্ষার তারিখঃ

হাইপারহাইড্রোসিস কোয়ালিটি অব লাইফ ইনডেক্স

সাধারণভাবে বলতে গেলে, চিকিৎসার আগে আপনি কীভাবে আপনার জীবন মান মূল্যায়ন করবেন?		**চিকিৎসার পরে আপনি কীভাবে আপনার জীবন মান মূল্যায়ন করবেন?**	
চমৎকার	১	অনেক ভাল	১
খুব ভালো	২	কিছুটা ভাল	২
ভাল	৩	একই	৩
খারাপ/নিকৃষ্ট	৪	একটু খারাপ	৪
খুবই খারাপ/নিকৃষ্ট	৫	অনেক খারাপ	৫

চিকিৎসার আগের সময়ের সাথে তুলনা করুন,

১) কাজ-সম্পর্কিত/ সামাজিক বিষয়, নিম্নলিখিত বিষয়সমূহ বিবেচনায় আপনি কীভাবে আপনার জীবন মান মূল্যায়ন করবেন :

	চিকিৎসার আগে					**চিকিৎসার পরে**				
লেখা	১	২	৩	৪	৫	১	২	৩	৪	৫
যেকোনো কাজ	১	২	৩	৪	৫	১	২	৩	৪	৫
অবসর	১	২	৩	৪	৫	১	২	৩	৪	৫
খেলাধুলা	১	২	৩	৪	৫	১	২	৩	৪	৫
করমর্দন	১	২	৩	৪	৫	১	২	৩	৪	৫
জনসমাগম	১	২	৩	৪	৫	১	২	৩	৪	৫
বস্তু আঁকড়ে ধরা	১	২	৩	৪	৫	১	২	৩	৪	৫
সামাজিক অনুষ্ঠান	১	২	৩	৪	৫	১	২	৩	৪	৫

২) ব্যক্তিগত বিষয়, আপনার সঙ্গীর সাথে। আপনি কীভাবে আপনার জীবন মান মূল্যায়ন করবেন :

	চিকিৎসার আগে					**চিকিৎসার পরে**				
হাত ধরে	১	২	৩	৪	৫	১	২	৩	৪	৫
অন্তরঙ্গ স্পর্শ	১	২	৩	৪	৫	১	২	৩	৪	৫
অন্তরঙ্গ সম্পর্ক	১	২	৩	৪	৫	১	২	৩	৪	৫

৩) আবেগ-সম্পর্কিত বিষয়; অতিরিক্ত ঘাম হওয়ার পরে আপনি অবস্থাটা কিভাবে মূল্যায়ন করবেন?:

	চিকিৎসার আগে					**চিকিৎসার পরে**				
আমি সবসময় নিজেকে বিচার করি	১	২	৩	৪	৫	১	২	৩	৪	৫
মানুষ আমাকে কিছুটা প্রত্যাখ্যান করে	১	২	৩	৪	৫	১	২	৩	৪	৫

৪) বিশেষ পরিস্থিতিতে- আপনি কীভাবে আপনার জীবন মান মূল্যায়ন করবেন:

	চিকিৎসার আগে					**চিকিৎসার পরে**				
বদ্ধ বা গরম পরিবেশে	১	২	৩	৪	৫	১	২	৩	৪	৫
যখন উত্তেজনা বা উদ্বিগ্ন	১	২	৩	৪	৫	১	২	৩	৪	৫
সমস্যা নিয়ে ভাবছেন	১	২	৩	৪	৫	১	২	৩	৪	৫
পরীক্ষার আগে/ জনসমক্ষে মিটিং/বক্তৃতা	১	২	৩	৪	৫	১	২	৩	৪	৫
স্যান্ডেল পরা/খালি পায়ে হাঁটা	১	২	৩	৪	৫	১	২	৩	৪	৫
রঙিন পোশাক পরা	১	২	৩	৪	৫	১	২	৩	৪	৫
স্কুল/কাজে সমস্যা হচ্ছে	১	২	৩	৪	৫	১	২	৩	৪	৫

মোট স্কোর		

Annexure- 2(A)

Consent Form

Assalamu Alaikum,

I am Ibrahim Khalil Nayem, student of B.Sc. in physiotherapy program at Bangladesh Health Professional Institute (BHPI) the academic institute of Centre for the Rehabilitation of the Paralysed (CRP) under the Faculty of Medicine, University of Dhaka. I am asking you to participate in a dissertation study which is consist of treatment application and data collection. My dissertation title is "**Iontophoresis as a treatment for primary hyperhidrosis: a Quasi-experimental study"**. The purpose of the study is to explore the role of electro-therapy which is a part of physiotherapy on hyperhidrosis disease in Bangladesh. A treatment session will take approximately 20 - 25 minutes and you have to take 9-10 session for appropriate outcome. After completing the intervention the data will be used for study.

During the period of intervention if you feel any emotional disturbance, social and economic risk and any other discomfort physical risk please tell me, I will stop the treatment immediately. I am committed that the study will not harmful or risk for you. There is no payment for taking part in the study. All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous.

Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during interview. If you have any query about the study or treatment procedure, you may contact with me or my supervisor **Muhammad Millat Hossain**, Associate Professor & Course Coordinator, Department of Rehabilitation Science, BHPI.

Do you have any questions before I start?

So, may I have your consent to start the intervention?

YES _____ NO _____

Signature of Data collector & Date: ……...

Signature of Participant & Date: …….

Signature of Researcher & Date: …….

Annexure-3(B)

সম্মতিপত্র

আসসালামু আলাইকুম।

আমি ইব্রাহিম খলিল নাঈম, সিআরপি এর শিক্ষাপ্রতিষ্ঠান বাংলাদেশ হেলথ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই) এর ফিজিওথেরাপি বিভাগে ঢাকা বিশ্ববিদ্যালয়ের অধিভুক্ত বিএসসি ইন ফিজিওথেরাপি কোর্সে অধ্যয়নরত একজন শিক্ষার্থী। আমি আপনাকে একটি গবেষণায় অংশগ্রহণের জন্য বলছি যা চিকিৎসা প্রয়োগ এবং তথ্য সংগ্রহ এই দুইটি প্রক্রিয়ার সমন্বয়ে গঠিত। আমার গবেষণার শিরোনাম **"প্রাইমারি হাইপার-হাইড্রোসিস চিকিৎসায় আয়োন্টোফোরোসিসঃ একটি পরীক্ষামূলক গবেষণা"**। এই গবেষণার উদ্দেশ্য বাংলাদেশের পরিবেশে অতিরিক্ত হাত ঘামা রোগে ফিজিওথেরাপির একটি বিভাগ ইলেকট্রোথেরাপির কার্যকরীতা বের করা। একবার চিকিৎসা নিতে ২০-২৫ মিনিট সময় লাগবে এবং ভালো ফলাফল পেতে হলে আপনাকে কমপক্ষে ৯-১০ বার চিকিৎসাটি নেওয়া লাগবে। চিকিৎসা নেওয়া শেষ হলে আমরা গবেষণার উদ্দেশ্যে আপনার রোগসংক্রান্ত তথ্য ব্যবহার করবো।

চিকিৎসার সময় আপনি চিকিৎসার কারণে কোনোরকম অশান্তি বা অস্বস্তি অনুভব করলে দয়া করে আমাকে জানাবেন, আমি সাথে সাথে চিকিৎসা বন্ধ করে দেবো। আমি অঙ্গিকার করছি এই গবেষণার দ্বারা আপনার কোনো ক্ষতি হবে না। এই গবেষণায় অংশগ্রহণের জন্য আপনার কোনোরকম অর্থ প্রদান করতে হবে না। আপনি যেসব তথ্য আমাকে দিবেন তা সম্পূর্ণ গোপন থাকবে এবং ভবিষ্যতে এই গবেষণার উপর ভিত্তি করে কোনো প্রতিবেদন বা প্রকাশনা বানানো হলে আপনার নাম ব্যবহার করা হবে না।

এই গবেষণায় আপনার অংশগ্রহণ সম্পূর্ণ স্বেচ্ছায় এবং নেতিবাচক কোনোকিছু অনুভব করলে যেকোনো সময়ে আপনি এই গবেষণা থেকে নিজেকে প্রতাহার করে নিতে পারবেন। আপনি পছন্দ করেন না বা উত্তর দিতে চান না এমন নির্দিষ্ট প্রশ্নের উত্তর না দেওয়ার অধিকারও আপনার রয়েছে। এই গবেষণার বিষয়ে আরো বেশী কিছু জানতে চাইলে আপনি আমার সাথে অথবা আমার সুপারভাইজার মোহাম্মদ মিল্লাত হোসেন, সহযোগী অধ্যাপক এবং কোর্স কো-অর্ডিনেটর, রিহ্যাবিলিটেশন সায়েন্স ডিপার্টমেন্ট, বিএইচপিআই এর সাথে যোগাযোগ করতে পারেন।

শুরু করার আগে আপনার কোনো প্রশ্ন আছে?

এই গবেষনায় অংশগ্রহণে আপনার অনুমতি আছে?

হ্যা ——— না ———

তথ্য সংগ্রহকারীর সাক্ষর ও তারিখ: .....

অংশগ্রহণকারীর সাক্ষর ও তারিখ: .....

গবেষকের সাক্ষর ও তারিখ: .....

Annexure-3(A)

Application for IRB Approval

Date: 14 February 2023
The Chairman
Institutional Review Board (IRB)
Bangladesh Health Professions Institute (BHPI), CRP
Savar, Dhaka-1343.Bangladesh

Subject: Application for review and ethical approval.

Dear sir,

With due respect, I am Ibrahim Khalil Nayem , student of B.Sc. in physiotherapy program at Bangladesh Health Professions Institute (BHPI) the academic institute of Centre for the Rehabilitation of the Paralysed (CRP) under the Faculty of Medicine, University of Dhaka. As per the course curriculum, I have to conduct a dissertation entitled "**Iontophoresis as a treatment for primary hyperhidrosis: a Quasi-experimental Study"** under the supervision of Muhammad Millat Hossain, Associate Professor & Course Coordinator, Department of Rehabilitation Science, BHPI.

The purpose of the study is to explore the role of electro-therapy on hyperhidrosis disease in Bangladesh. The study involves face-to-face interview by using semi-structured questionnaire to explore the effectiveness of iontophoresis on persons with hyperhidrosis at Dhaka, Mymensingh and Jashore in Bangladesh that may take 20 to 30 minutes to fill in the questionnaire and there is no likelihood of any harm to the participants. Related information will be collected from the patients' guide books. Data collectors will receive informed consent from all participants and the collected data will be kept confidential.

Therefore, I look forward to having your kind approval for the dissertation proposal and to start data collection. I can also assure you that I will maintain all the requirements for study.

Sincerely,

Ibrahim Khalil Nayem
4th Year B.Sc. in Physiotherapy
Session: 2017-2018 Student ID: 112170376
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Dissertation presentation date: 9th January 2023

Shofiq 18.02.2023

Head, Department of Physiotherapy, BHPI
Md. Shofiqul Islam
Associate Professor & Head
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343

Recommendation from the dissertation supervisor

Muhammad Millat Hossain
Associate Professor & Course Coordinator
Department of Rehabilitation Science, BHPI.

Annexure-3(B)

IRB Permission letter

বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)
(The Academic Institute of CRP)

Ref: CRP/BHPI/IRB/03/2023/720 Date: 13/03/2023

To
Ibrahim Khalil Nayem
B.Sc. in Physiotherapy
Session: 2017-2018, DU Reg. No: 8664
BHPI, CRP, Savar, Dhaka- 1343, Bangladesh

Subject: Approval of the dissertation proposal **"Iontophoresis as a Treatment for Primary Hyperhidrosis: a Quasi-Experimental study"**-by ethics committee.

Dear
Ibrahim Khalil Nayem,
Congratulations
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the Principal Investigator Muhammad Millat Hossain, Associate Professor & Course Coordinator, Dept. of Rehabilitation Science, BHPI, as dissertation supervisor. The following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Dissertation Proposal
2	Questionnaire (English and Bengali version)
3	Information sheet & consent form

The purpose of the study is to explore the role of electro-therapy which is a part of physiotherapy on hyperhidrosis disease. Should there any interpretation, typo, spelling, grammatical mistakes in the title, it is the responsibilities of the investigator. Since the study involves questionnaire that takes maximum 20-25 minutes and have no likelihood of any harm to the participants. The members of the Ethics committee approved the study to be conducted in the presented form at the meeting held at 09:00 AM on January 9, 2023 at BHPI, 34th IRB Meeting.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

Muhammad Millat Hossain
Associate Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB) BHPI,
CRP, Savar, Dhaka-1343, Bangladesh

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ। ফোন: +৮৮ ০২ ২২৪৪৫৪৬৪-৫, +৮৮ ০২ ২২৪৪১৪০৪, মোবাইল: +৮৮ ০১৭৩০ ০৫৯৬৪৭
CRP-Chapain, Savar, Dhaka-1343, Bangladesh. Tel: +88 02 224445464-5, +88 02 224441404, Mobile: +88 01730059647
E-mail : principal-bhpi@crp-bangladesh.org, Web: bhpi.edu.bd

Annexure-3(C)

Permission letter for Data Collection

Approved
29.3.23
Prof. Dr. Md. Omar Ali Sarker
Principal
Bangladesh Health Professions Institute
CRP, Savar, Dhaka

23rd March, 2023
The Principal
Bangladesh Health Professions Institute (BHPI)
CRP, Savar, Dhaka-1343

Through: Head of Physiotherapy Department, BHPI.

Subject: Application for seeking permission to collect data for conducting dissertation project.

Sir,

With due to respect and humble submission to state that I am Ibrahim Khalil Nayem, a student of 4th year B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI). The Ethical committee has approved my dissertation project entitled: "**Iontophoresis as a treatment for primary hyperhidrosis: a Quasi-experimental study"** under the supervision of Muhammad Millat Hossain, Associate Professor & Course Coordinator, Department of Rehabilitation Science, BHPI. I have to collect data for my dissertation project from the persons who have excessive sweating. BHPI has a large number of population including honorable faculties, students and other staffs and I want to collect data from here. So, I need permission for data collection from BHPI. I would like to assure that anything of the study will not be harmful for the participants and the Institute itself.

I also need your kind recommendation to collect data from CRP Nursing College to conduct a quality full study.

I, therefore pray and hope that you would be kind enough to grant my application for data collection from BHPI and recommendation for data collection from CRP Nursing College.

Sincerely,

Ibrahim Khalil Nayem
4th Year B.Sc. in Physiotherapy
Session: 2017-2018 Student ID: 112170376
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Forwarded & recommended
Millat Hossain
25/03/2023

Recommended
Shofiq
25.03.2023
Md. Shofiqul Islam
Associate Professor & Head
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343