

Effects of Vipassana Insight Meditation on Quality of Life and Plasma Endogenous Beta-endorphin Level in Registered Meditators Practicing Meditation at the Well-established Meditation Centres in Selangor

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Abstract

Background: The essence of teaching-learning practice in Buddhism is based on "Access concentration" and "Vipassana Insight Meditation". The practical process includes the synthesis of the inter-relationship of conditionality, dependent arising and path to purification. Nowadays, "Vipassana Insight Meditation became an interesting practice around the world. The main outcome of "Vipassana Insight Meditation is to achieve four sublime modes of living: Loving-kindness, Compassion, Appreciative joy, and Equanimity. This project is aimed to enhance the scientific proof of the effect of Vipassana Insight meditation (Dhamma propagation). The objectives were to measure the effects on plasma endogenous beta-endorphin levels in the meditators and to determine the effects of insight meditation on quality of life by WHOQOL-BREF questionnaires.

Method: A cross-sectional study was conducted among registered meditators from the intakes of the Vipassana insight meditation course run by BSM- Vipassana Meditation Centers in Malaysia. The meditators were divided into two groups Group A- 20 junior meditators who were contemplating phase 1 or phase 2 access concentration and Group B- 20 senior meditators who were contemplating a higher level of access concentration.

Results: A total of 40 meditators participated, with 20 senior meditators and 20 junior meditators. The domain scores of WHO quality-of-life among all the meditators are as follows: Physical health 56.83, Psychological health 60.23, Social relationship 65.95, and Environmental 70. Both junior and senior meditator groups have significant outcomes after the meditation practice.

The beta-endorphin level was detected in 8 junior meditators and among them, four participants were found to have a significant after the meditation course ($Z = -2.521$) ($p = .012$). On the other hand, the beta-endorphin level is detected in 10 participants of the senior meditator's group, among them, all of them have a significant level of increase in the level of the hormone after the meditation course ($Z = -2.803$) ($p = .005$).

Conclusion: This study provides strong evidence of improvement in the quality-of-life measure after the meditation course for all the meditators. The beta-endorphin level before and after the meditation shows that there is a scientifically proven influence of meditation on the hormone level. The results from the senior meditators group express that most of them have a significant increase in the level of beta-endorphins even before the meditation course. A similar result was observed in three of the junior meditators. That is the essence of insight meditation which is a dynamic development of individualized attainment and contemplation of the state of mind.

Keywords: Quality of Life; Endogenous Beta Endorphin; Vipassana Insight Meditation

Abbreviations

WHO: World Health Organization; QOL: Quality of Life

Introduction

“Essence of Buddhism and vipassana insight meditation”

The essence of teaching-learning practice in Buddhism is based on “Access concentration” and “Vipassana Insight Meditation” [19]. The practical process includes the synthesis of the inter-relationship of conditionality, dependent arising, and path to purification. Nowadays, “Vipassana Insight Meditation became an interesting practice around the world [18,19].

For the time being, the world is in a state of severe sickness: suffering and beyond suffering. Many people are looking for a “Stress-free environment”, a Peaceful Society and Ultimate Happiness²⁵. The main outcome of “Vipassana Insight Meditation is to achieve four sublime modes of living: Loving-kindness, Compassion, Appreciative joy, and Equanimity [20].

The “Access Concentration is the foundation of progress to “Vipassana Insight Meditation” [25].

Many mindfulness centers adopted the initial phase of “Access concentration” and were unable to reach the level of knowledge of Vipassana Insight Meditation. That is the main reason why most of the trainees are unable to attain a sustainable level of a “Stress-free environment”, Peaceful Society and Ultimate Happiness, as they determine to [19].

“Access concentration” has five phases of progress [28]:

- A phase of the initial application
- A phase of sustainable application
- A phase of zest
- A phase of pleasant feeling
- A phase of one-pointedness

Once trainees attain this state of mind, then they can progress to the “Vipassana Insight Meditation” in which ten states of Insight knowledges [18,25].

Phases 1 and 2 are the early stage of progress and phases 3,4 and 5 are considered late states of progress [28]. The teacher will decide who attains what level of phases based on the individual

confidential discussion [28]. No meditators will attain insight knowledge without mastering these phases [18,28].

“Vipassana Insight Meditation” is far more advanced than “Mindfulness practice”

Having said that “Vipassana Insight Meditation” is far more advanced than “Mindfulness practice”. Moreover, there is a standardized protocol for trainees in “Vipassana Insight Meditation” [18,25]. The standardized protocol includes preliminary devotion procedures like: Purification of virtue and Concentration of mind to overcome the five hindrances [19,25]. Minimum practicing hours must be 80 hours [19] to achieve a sustainable level of mind to be able to access the insight knowledge.

Over the past decade, mindfulness meditation is assumed to be a method of practice to intervene the stress-related disorders in people from workplaces, schools, and patients from the palliative care units as a stress reduction therapy that has positive effects on general well-being. The first meta-analysis study (Zarah., *et al.* 2004 -2011) identified the helpful specific outcomes in youths [1].

In addition to that, there are several meta-analyses and systematic reviews about the mindfulness-based therapy used as a part of the treatment of disorders related to stress anxiety, and depression associated with physical illness related to patients from the palliative care unit [2]. Based on the meta-analysis, there are many gaps encountered to validate the outcomes of the expected results. Based on the feedback of reviewers, firstly, it would be valuable to explore and introduce insight meditation through Buddhism’s way of teaching which is rooted and well-established in the (Vipassana Insight Meditation) training centers in Asia. Researchers could be able to overcome the bias of methods of practice (Yoga, Mindfulness-based therapy, Mindfulness-based stress reduction therapy, transcendental meditation, Zen meditation....etc) that are implied in various articles [3].

“Gaps in the teaching methodology”

Secondly, they have found a huge gap in methodology in a collection of samples, various sample sizes, various timing, and various groups without randomization. The sample population is mainly from the palliative care units, terminally ill patients, and patients with chronic pain in which most of the patients have been on various types of medication which may interfere with the validity

of quantitative biochemical test results as well as qualitative street-related questionnaires and questionnaires of quality of life [4].

Moreover, biochemical analysis proves that stress-related parameters do not include beta-endorphin which is an endogenous opioid, and it is strongly linked to the sense of well-being both physically and mentally during insight meditation [5].

In 2010 (Adam, *et al.*) reviewed the basic understanding of endorphins and pain management: beta-endorphins are proteins that are produced by the pituitary gland in response to physiologic stressors such as pain. They function through various mechanisms in both the central and peripheral nervous systems to relieve pain when bound to their mu-opioid receptors. Opioid medications mimic the effects of natural endorphins, competing for receptor binding.

In the acute condition of illness, exogenous opiates inhibit the production of endogenous opiates whereas, in the chronic condition of illness, exogenous opiates inhibit the production of both endogenous opiates and mu-opioid receptors. If the sample population is taken from these samples, it will end as drawbacks of long-term opioid use: opioid-induced hyperalgesia, tolerance, and addiction. In the future, we hope to understand the dynamics between beta-endorphins and non-opioid pain medications to offer patients maximal pain management with minimal associated risk [6].

That is the reason why much more evidence-based research needs to prove that naturally occurring endogenous opioids which could be able to produce without physical exercises are the safest and the best adjunct treatment option to the management of both physical and psychiatric pain in chronically ill patients and patients from palliative care units.

Since early 2000, many researchers proved that the effects of meditation could reduce depression, anxiety, and psychological pain [10].

But the barriers and biases in their studies such as a different method of practice, no specific guidelines for the practice to achieve the level of meditation and their samples are patients who have

already been on various types of medications which may affect the results of plasma level of hormone [11,12].

Major limitations and barriers

When the results and conclusion of previous articles were reviewed, it was found that the following facts were the major limitations and barriers to validating results:

- Samples were collected from patients with various types of diseases.
- Patients might have been prescribed prior medications for the diseases which may change the results of blood samples.
- The method of meditation varies from center to center.
- The duration of meditation and level of (stages) of the progress of meditation that could have affected the quality of life and biochemical changes in the blood is not clearly stated, no valid references.
- There were no samples available from regular meditators to prove the long-term effects of meditation.

Materials and Methods

Study design, setting, participants

A cross-sectional study was conducted among registered meditators from the intakes of the Vipassana insight meditation course run by BSM- Vipassana Meditation Centers in Malaysia. The meditators were divided into two groups Group A- 20 junior meditators who are contemplating phase 1 or phase 2 access concentration and Group B- 20 senior meditators who are contemplating a higher level of access concentration.

Inclusion criteria were meditators of age between 18-90 years and both gender, exclusion criteria were meditators of age less than 18 and more than 90, meditators on opioid medications, meditators who are unable to achieve minimum target meditation hours (80 hours).

Study instruments

The WHOQOL-BREF questionnaire survey was used to determine the effects of insight meditation on quality of life. WHOQOL-BREF focused on accessing four domains.

	Domain	Facets incorporated with domain
1	Physical health	Activities of daily living, dependence on medicinal substances and medical aids, energy and fatigue, mobility, pain and discomfort, sleep and rest, work capacity
2	Psychological health	Negative feelings, positive feelings, self-esteem, spirituality/religion/personal beliefs, thinking, learning, memory, concentration, bodily image and appearance,
3	Social relationship	Personal relationships, social support, sexual activity
4	Environment	Freedom, physical safety and security, health and social care, physical environment, opportunities for recreation

Table a

Blood samples (3-5 ml) for the Beta-endorphin test were taken from meditators aged 18-90 years old including both genders.

Data collection procedures

The research team visited meditation centers 2 weeks before the samples and data collection and gave a briefing regarding the purpose of the project, inclusion criteria of age limit, and exclusion criteria such as the range of age group, those who are on opioids medications, and other conditions which could affect the hormone level.

The blood samples and data were collected from the meditators group who are registered with Insight meditation centers. The purpose of the research was explained, and informed consent was taken.

Ethical approval was obtained from University Tunku Abdul Rahman Scientific Ethical and Review Committee (UTAR SERC) approval number (U/SERC/87/2022).

Results and Discussion

A total of 40 meditators participated in the study, 20 of them were senior meditators and the other 20 were junior meditators. The mean age of the participants was 55 years old, the youngest 37-year-old and the eldest 76 years old. Among all the meditators, 15 (37.5%) were male and 25 (62.5%) were female.

The effects of insight meditation on quality-of-life (Domain scores of quality-of-life)

WHOQOL-BREF questionnaires have been divided into four domains as domain 1, physical health, domain 2, psychological health, domain 3, social relationships, domain 4, environment. Among all the domains of quality of life, the environmental domain has the highest scores among all domains of quality of life.

The domain scores of WHO quality-of-life among all the meditators are as follows: Physical health 56.83, Psychological health 60.23, Social relationship 65.95, and Environmental 70.

sa	Domain 1 Physical health Mean (SD)	Domain 2 Psychological health Mean (SD)	Domain 3 Social Relationship Mean (SD)	Domain 4 Environmental Mean (SD)	Overall Domain Score Mean (SD)
All meditators (N = 40)	56.83 (8.92)	60.23 (10.47)	65.95 (13.55)	70.00 (11.93)	253.00 (36.41)
Junior meditators (N = 20)	57.95 (9.75)	60.70 (10.75)	64.40 (13.19)	70.40 (13.63)	253.45 (40.55)
Senior meditators (N = 20)	55.70 (8.12)	59.75 (10.43)	67.50 (14.06)	69.60 (10.29)	252.55 (32.80)

Table 1: The domain scores of WHO quality-of-life.

Whereas in the junior meditator’s group: Physical health was 57.95, Psychological health was 60.70, Social relationship was 64.40, and Environmental 70.40. At the same time, in the senior’s group: Physical health was 55.70, Psychological health was 59.75 Social relationship was 67.50, and Environmental 69.60.

Plasma endogenous beta-endorphin levels

Beta-endorphin values before and after the meditation was shown in table 2.

	Junior Meditators N = 20		Senior Meditators N = 20	
	Pre-Endorphin level	Post-Endorphin level	Pre-Endorphin level	Post-Endorphin level
1	10.05	15.06	140.85	232.3
2	7.83	12.49	67.51	85.34
3	BD	BD	BD	BD
4	BD	BD	BD	BD
5	BD	BD	165.69	479.18
6	BD	BD	BD	BD
7	BD	BD	BD	BD
8	BD	BD	69.04	880.83
9	BD	BD	BD	BD
10	91.53	114.51	BD	BD
11	141.95	628	BD	BD
12	10.86	12.04	BD	BD
13	BD	BD	39.58	42.41
14	BD	BD	BD	BD
15	1.92	19.02	13.7	21.68
16	85.23	102.12	30.54	53.77
17	BD	BD	BD	BD
18	BD	BD	172.81	1777.11
19	4.88	11.41	98.37	281.14
20	BD	BD	15.28	35.65

Table 2: Endorphin values before and after the meditation of junior and senior meditators.

BD = Undetectable level of Endorphin

	Junior Meditators N = 8		Senior Meditators N = 10	
	Pre-Endorphin level	Post-Endorphin level	Pre-Endorphin level	Post-Endorphin level
1	10.05	15.06	140.85	232.3
2	7.83	12.49	67.51	85.34
3	91.53	114.51	165.69	479.18
4	141.95	628	69.04	880.83
5	10.86	12.04	39.58	42.41
6	1.92	19.02	13.7	21.68
7	85.23	102.12	30.54	53.77
8	4.88	11.41	172.81	1777.11
9	-	-	98.37	281.14
10	-	-	15.28	35.65

Table 3: Endorphin values before and after the meditation of all meditators, junior, and senior meditators.

Wilcoxon Signed Ranks Test has been conducted to compare the beta-endorphin level before and after meditation among meditators. Among the junior mediator's group, the beta-endorphin level was detected in 8 participants. Out of eight participants, four participants were found to have a significant increase in the level of hormones up to 19- 600 after the meditation course ($Z = -2.521$) ($p = .012$). In addition to that, three of them have a significant increase in the level of hormones 85- 141.

On the other hand, the beta-endorphin level is detected in 10 participants of the senior mediator's group, among them, all of them have a significant level of increase in the level of the hormone after the meditation course ($Z = -2.803$) ($p = .005$). In addition to that, eight out of ten participants have a significant level of increase in hormone levels even before the meditation practice.

Discussion

This study provides strong evidence of improvement in the quality-of-life measure after the meditation course for all the meditators. WHO Quality of life domain- 1 includes the assessment of activity of daily living, dependence on medicinal substances and aids, the amplitude of energy and fatigue, mobility, pain and discomfort, sleep and rest, and work capacity. The study found no significant differences between junior mediators and senior meditators for domain 1 of quality of life. The study by Yu-yun Chang, *et al.* 2018 found similar results that the correlation between the number of in-class hours in the mindfulness course and the degree of improvement in psychological symptoms was not significant [31].

With regards, to the domain-2 which consists of assessing negative and positive feelings, self-esteem, spiritual beliefs, thinking, learning, and memory. In this case, the junior mediators had better quality of life for domain 2 not statistically significant. The studies by Damiao, *et al.* 2020 found similar results that there is no significant effect of a required large-group mindfulness meditation course on the mental health and quality of life of medical students. The development of the state of mind depends on different methods and it demands incorporating a change in life habits by the individual [29].

The third domain of WHO quality of life comprises assessing personal relationships social support and sexual activity. In this

study, no significant differences between junior mediators and senior meditators for domain 3 quality of life. The studies by Maria, *et al.* (2018) found contrary results that mindfulness-based interventions represent a valuable and promising contribution to sexual activity. However, the author suggested that more randomized studies with active control groups are necessary to establish the benefits of mindfulness-based interventions in men [30].

The last domain assesses freedom, physical security, health and social care, home environment, leisure activities, financial resources, transport, and physical environment, etc. Which, no significant differences between junior mediators and senior meditators for this domain. The studies by Taweesak, *et al.* (2018) found contrary results that eight weeks course of meditation for healthy subjects significantly improves the quality of life among meditators [33].

The study by Henry, *et al.* 2008 compared the effects of mild activation inducing a state of well-being and stronger activation results in analgesia and euphoria related to beta endorphins [7]. In this article, it is clearly stated that the effects of beta-endorphin depend on the activity state of the endorphin system. Pannkep, *et al.* 1986 found the neurochemistry of beta-endorphin in which some state of stressful condition may induce the analgesic action called stress-induced analgesia [8]. After this evidence-based finding, they concluded that the general role of beta-endorphin restores the state of homeostatic balance and induces general well-being [9].

The study by Ivan, *et al.* 2008, stated that the relationship between mindfulness-based stress reduction therapy and long-term quality-of-life measure. However, they have stated that the improvement in the quality of life depends on how much time they spend on meditation [13].

In 2001, Daine, *et al.* reported the effects of MBSR on health-related quality of life in a heterogenous population and concluded that the mindfulness meditation program can enhance the functional status and well-being as well as may have long-term beneficial effects [14].

Previous studies on mindfulness-related interventions reported mixed results regarding the relationship between time spent at

home for meditation and outcomes of quality of life. In their studies, there are many limitations such as different duration of meditation, meditation at home and center, immediate effects, and long-term effects ...so on [15-17].

In terms of hormone level, both groups proved that there is a positive effect of beta-endorphin level in meditators however, there may be a chance of having a normal pattern of hormones in the meditator's group may be due to the change in the feedback sensitivity caused by this mental technique [30]. The state of mind and attainment of level is individualized. We concluded that the rise in the hormone level does not directly correlate with the practicing hours. It is solely depending on the individual attainment at that stage and the ability to maintain the dynamic development of meditation practice. That is why, the results revealed non-detectable levels and most senior meditators have higher levels of hormone even before the course.

The study by J R Infante., *et al.* 1998 explained that the ACTH and Beta-endorphin in transcendental meditation and concluded that meditation has a significant effect on the neuroendocrine axis, however, there may be a chance of having a normal pattern of hormones in the meditator's group may be due to the change in the feedback sensitivity caused by this mental technique [26].

In 1995 J K Harte., *et al.* reported the effects of running and meditation on beta-endorphin, corticotrophin-releasing hormone, and cortisol in plasma and on mood in which the author concluded that a positive effect is associated with plasma CRH immunoreactivity which itself is significantly associated with circulating beta-endorphin level. They found out the hormone levels were generally high but erratic in both groups, but CRH immunoreactivity is related to meditation [27].

The results from the senior meditators group showed that most of them have a significant increase in the level of beta-endorphins even before the meditation course. A similar result was observed in three of the junior meditators. That is the essence of insight meditation which is a dynamic development of individualized attainment and contemplation of the state of mind.

The individualized development of progress of the state of mind is a fundamental principle for meditators [18].

Some senior meditators could achieve a sustainable level of state of mind even after the courses which means the state of mind called four illimitable: unconditional loving kindness, appreciative joy, compassion, and equanimity illuminate their normal daily activities [18].

About the above evidence, we would like to understand the practice of Vipassana Insight Meditation in Buddhism is a critical issue to explore the references related to (Original text of Buddhism) Abidhamma [18].

In the Abidhamma text, it is clearly stated that after the fundamental method of insight meditation practice, the meditators will experience the effects such as tranquility, lightness, the malleability of body and consciousness, proficiency, and rectitude. These effects are strongly related to the effects of raised plasma endogenous endorphin levels and generalized well-being [18].

According to the references, the trainees who reached a sustainable level of tranquility will attain both physical and mental well-being, free from the suffering of physical untoward sensations and mental miserable thoughts. It is necessary to have a minimum of 80 hours of insight meditation practice to achieve the required level of state of tranquility of mind [19].

Moreover, in the long term, senior meditators attain a sustainable level of equanimity and joy in daily life which is a strong indicator of improvement in the quality of life.

Conclusion

Vipassana Insight meditation includes different degrees/levels of control over the mind and based on the level it affects both physical and mental well-being as well as the high quality of life.

The meditation practice is a process of dynamic development of the mind. The meditators who attain a sustainable level of state of mind get the effects of positive hormonal changes and quality of life. The effects of meditation practice on hormone level depends on individual efforts of attainment and sustainable development of the attainment of the state of mind. The investigation of the long-term effects of meditation is very much needed to explore the report on the individualized attainment of the state of mind.

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Conflict of Interest

No conflict of interest exists among all authors.

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