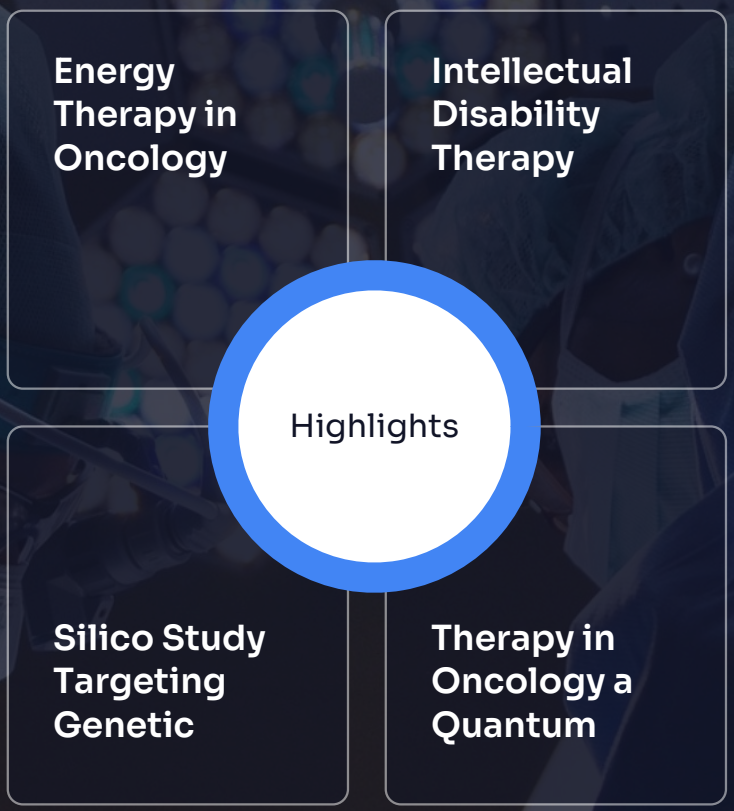
GLOBAL JOURNAL
of Medical Research: K

Online ISSN: 2249-4618
Print ISSN: 0975-5888
DOI: 10.17406/GJMRA

INTERDISCIPLINARY



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VOLUME 26 / ISSUE 1 / VERSION 1.0

Global Journal of Medical Research: K
Interdisciplinary

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Volume 26 Issue 1 (Ver. 1.0)

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USA Tax ID: 98-0673427

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Contents of the Issue

Global Journal of Medical Research: K
Interdisciplinary
Volume 26 Issue 1 Version 1.0 Year 2026
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

In-Silico Analysis - Phytochemicals Against 'Mglur5' for Therapeutic Intenvention in the Intellect, in Fragile X Syndrome

By Ayushi
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Abstract- 'Intellectually different ability or intellectual disability (ID)' exhibits neurodevelopmental deficits, which manifests as limitations in 'intellectual functioning' and 'adaptive behavior'. 'Fragile X syndrome' is the common genetic cause of ID. Therefore in this in-silico research, the protein 'mGluR5' was targeted for the therapy of ID, in Fragile X Syndrome. In Fragile X syndrome, due to mutation in FMR1 gene, there's lack of FMRP (Fragile X Mental Retardation Protein), resulting in unimpeded activity of 'mGluR5', which leads to aberrant dendritic development with mis-signalling. This results in ID, autism and psychopathology. An attempt towards overcoming this problem of ID, in Fragile X syndrome, in this research, 'mGluR5' was targeted against 19 different phytochemicals, collected from IMPPAT 2.0 database. 3D- structure of 'mGluR5' was obtained from RCSB-PDB, then the phytochemicals were docked against 'mGluR5' using CB-Dock.

Keywords: mGluR5, Fragile X Syndrome, Intellectual disability, Phytochemicals, In-silico docking, CB-Dock, Lipinski's rule of 5, beta-Bisabolene, Cirisilineol.

GJMR-K Classification: NLM Code: WL 470

Strictly as per the compliance and regulations of:

In-Silico Analysis - Phytochemicals against 'mGluR5' for Therapeutic Intenvention in the Intellect, in Fragile X Syndrome

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Keywords: mGluR5, Fragile X Syndrome, Intellectual disability, Phytochemicals, In-silico docking, CB-Dock, Lipinski's rule of 5, beta-Bisabolene, Cirisilineol.

Note: 'Intellectually different ability' is somewhat positive term, which has been used as a substitute of 'Intellectual disability' in this article. As the word 'disability' indicates 'lack of capabilities', whereas, 'different ability' indicates such 'capabilities, which are different from that of others'. Thus giving a positive meaning to the word 'disability'. Every individual with disabilities are 'differently-abled'. This article is not only about 'scientific research', but, also wants to convey this message, that, "nobody is intellectually disabled, rather they are intellectually differently-abled." This in-silico research has the motive, to take the first step towards the discovery of such novel therapeutic compounds, which can attempt to enhance their 'intellect and capabilities', so that, they can face this world like other intellectual human beings.

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I. Introduction

Intelligence' is the general mental ability for reasoning, problem-solving and learning. This mental ability integrates other cognitive abilities and works also, such as, perception, attention, memory, language or planning. Neuroimaging studies have generally supported that, a frontoparietal network is relevant for intelligence. This same network is also found to be associated with other cognitive functions, such as, perception, storage of short-term memory and language. This network has a distributed nature and is involved in different cognitive abilities and functions. This fact clearly explains that, the nature of intelligence is 'integrative'. [1].

Jung and Haier looked into 37 structural and functional studies on neuroimaging, which were published between 1988 and 2007. They found some commonalities in their study. On the basis of these commonalities, they proposed 'Parieto-Frontal Integration Theory (PFIT)'.

Given below, is somewhat easy explanation of our Brain's functioning, associated with intelligence -

1. In the first stage of this process, occipital and temporal areas process sensory information.
2. Parietal angular gyrus, supramarginal gyrus, and, superior parietal lobule are utilized for integration and abstraction of the sensory information. This is involved in the second stage of process.
3. In the third stage of this process, the parietal areas interact with the frontal lobes. This interaction leads to - solving problems, evaluation and testing of hypothesis.
4. Then, in the fourth stage of this process, the anterior cingulate, is involved in selection of response and inhibiting the alternative responses, after above three stages of this process.

Thus, we can say that, frontal, parietal, temporal and occipital areas are involved in the above-mentioned process. However, Jung and Haier say that, it is not necessary that, all these areas are equally essential for every individual's intelligence. Regions of brain of the dorsolateral prefrontal cortex, such as BAs 9, 45, 46 and 47; and, the parietal cortex, such as BAs 7 and 40, can

be considered as most important parts for the intelligence of a human being. [1, 2].

Thus, we can say that, frontoparietal network of our brain maybe necessary for intelligence. But, this network is also relevant for working memory. [1,3]. This was studied by Gray et. al.. [1, 4]. Commonality between intelligence and working memory was also discovered during the studies on animals, by Matzel and Kolata. [1, 5].

a) Intellectually Different Ability (Intellectual Disability)

People with 'intellectually different ability or intellectual disability (ID)' have neurodevelopmental deficits. This neurodevelopmental deficit is shown by limitations in 'intellectual functioning' and 'adaptive behavior'. These disabilities begin in childhood, and symptoms appear before the age of 22. Before, studying ID in more detail, let us take a look at the concept of 'Intellectual functioning'. [6].

'Intellectual functioning (IF)' is also called 'Intelligence'. It includes multiple mental activities, such as - logical reasoning and practical intelligence (problem-solving), ability to learn things, verbal skills, etc. IF expresses itself through multiple capabilities, behaviors, thoughts and emotions. We can also say that, IF is the global ability which helps us to understand and interact with reality. It is measured in terms of 'Intelligence quotient (IQ)'. To measure this, IQ tests are taken. The median of this test is 100 and standard deviation is 15. If the score of this test is 70 or below, that is the indication of ID. [6].

Adaptive behavior disabilities are expressed as lack of competence in social, conceptual and practical skills. These skills are quite poor in the people having ID. [6].

b) Few Genetics and Environmental Factors of ID

ID can develop due to various genetic mutations and diseases, or, environmental reasons. The genetic abnormalities responsible for ID could be mutation in a gene, copy number variation, or chromosomal abnormality that cause inborn errors of metabolism, defect in neurodevelopment and neurodegeneration. Environmental reasons can be, maternal exposure to toxin or infectious agents, uncontrolled maternal medical conditions, complications in parturition, and post-natal trauma and exposure to toxin/infectious agents. The most common environmental reason for ID, which can be prevented is 'fetal alcohol syndrome'. 'Down's syndrome' is the most common chromosomal cause for ID, and, the most common genetic cause for ID is 'Fragile X syndrome'. [6].

In 'Fragile X syndrome', there's a single gene mutation in the 'FMR1' gene. FMR1 gene is actually a transcription factor of several genes (hundreds of genes) expressed in the 'Central Nervous System (CNS)' and its disruption causes 'ID' and 'behavioral disturbance and seizure.' [6, 7].

In 'Rett Syndrome', neurodegeneration leads to ID. It is an X-linked dominant degenerative condition, which shows up only in females, secondary to mutation of the 'MeCP2 gene'. In the patients of Rett Syndrome, at the substantia nigra cerebral atrophy occurs, which causes defects in the dopaminergic nigrostriatal pathway. This cerebral atrophy begins at the age of 6 to 18 months. [6, 8].

When fetus is exposed to alcohol, that exposure inhibits the production of retinoic acid, which is a necessary signaling molecule for nervous system's development. Consumption of even a small amount of alcohol in any trimester of gestation period (pregnancy), leads to the development of fetal alcohol syndrome. [6, 9]. Exposure to opioids, cocaine and teratogenic medications, may also be the cause of 'Intellectual disability'. [6].

Rubella and HIV are few commonly known infectious agents, which can cause Intellectual Disability. When the pregnant mother is infected with rubella, during the initial trimester of gestation period, 10-15% of the time, it leads to 'Intellectual Disability'. This probability can be above 15%, if this infection occurs, during the first month of pregnancy. If the pregnant mother is vaccinated, then this infection of rubella can be prevented. [6, 10]. HIV in infants may also lead to encephalopathy, seizures and Intellectual disability within the first year of life secondary to microcephaly, immunosuppression and *Pneumocystis jiroveci pneumonitis* (PCP) infection. This HIV may get transferred vertically from mother to infant. [6, 11].

Few uncontrolled maternal medical conditions during the gestation period may also increase the risk of ID, such as, Pregnancy hypertension, Asthma, urinary tract infection, pre-pregnancy obesity, and pre-gestational Diabetes. [6, 12]. Some other medical conditions, such as, uncontrolled maternal Diabetes, malnutrition and obstetrical complications, which causes anoxia, may also cause ID. [6, 13]. ID can be acquired during early childhood, due to infections (maybe Encephalitis or Meningitis), head trauma, asphyxia, intracranial tumor, malnutrition and exposure to toxic substances. [6, 14].

c) Fragile X Syndrome - Science Behind ID

This is a common genetic cause of ID, which affects 1 in 4,000 people. The Fragile X protein, FMRP (Fragile X Mental Retardation Protein), regulates the dendritic growth, with the GABAergic system being especially sensitive. Lack of FMRP (Fragile X Mental Retardation Protein), results in unimpeded (lack of inhibition by FMRP) activity of 'mGluR5', which leads to aberrant dendritic development with mis-signalling, This results in ID, Autism and Psychopathology. [15, 16]. Trial against 'mGluR5' has also been performed, with the motive to replace the inhibitory effect of the missing FMRP protein. Phase 1 trial of 'Fenobam' has suggested

a promising efficiency based on a single dose. [15, 17]. Additionally, the antibiotic 'Minocycline' has also shown inhibition of mGluR5 receptor and some efficacy. [15, 18, 19].

In this in-silico research, 'Intellectually different ability (Intellectual disability)' due to 'Fragile X syndrome' has been targeted by the phytochemicals, to obtain a few partially validated compounds against ID.

Now, let us take a look at, some of the medicinal plants, which are positively effective on our Brain, from which the phytochemicals have been collected for this research.

d) Medicinal Plants – on our Brain

1. *Bacopa monnieri:* This plant is also known as *'Brahmi'* or 'Whaterhyssop'. It is used in *Ayurveda* for its ability to enhance memory and control the level of sugar in the blood. [20, 21]. It contains various active compunds such as alkaloids, saponins and curcurbitacins, which exhibit different biological activities. It has the potential to treat multiple brain-related diseases, such as Alzheimer's disease, Parkinson's disease, Attention Deficit Hyperactivity Disorder and Depression.[21].
2. *Withania somnifera:* This plant is also known as *'Ashwagandha'* [20, 22]. This is also known as 'Indian ginseng' or 'Indian winter cherry'. The name *'Ashwagandha'* is derived from two words - '*ashwa',* which means 'horse', and, '*gandha',* which means 'fragrance', refers to the smell or aroma of this plant's fresh roots. It is said that, when someone consumes its roots, that person gains similar power as the horse. [22, 23]. Since ancient time, it has been traditionally used in *Ayurvedic* medicine, which enhances the strength of 'Nervous system'. It can provide multiple benefits to our brain, such as – Ability to treat neurodegenerative disorders, Obsessive Compulsive Disorder, Alcohol withdrawal syndrome, and, anti-inflammatory effects. [22].
3. *Centella Asiatica:* This plant is also known as '*Mandukparni'.* [20]. This plant has been used for centuries in *Ayurvedic* and Chinese medicine, for its cognitive benefits. [24]. Few modern scientific studies, which have been performed on rodents, and, in human subjects, have shown that, whole *Centella asiatica* extracts and some of its active compounds, exhibit the ability to enhance cognition or neurotropic properties. [24-30]. Therapy given by '*Centella asiatica'* has also been found to reduce oxidative stress and mitochondrial dysfunction in rodents. It also exhibit neuroprotective potential in chemically induced Alzheimer's disease. [24, 31-35].
4. *Ocimum Sanctum:* This plant is also known as '*Ocimum tenuiflorum'.* Traditionally, it is also known as 'Holy basil' or '*Tulsi'.* [20, 36]. This medicinal plant has the potential to provide many different health benefits. Various scientific researches have shown that this medicinal plant can exhibit anti-stress potential, but with higher doses. Extract of this plant was found to inhibit the release of cortisol. It was also found to exhibit the significant CRF1 receptor antagonist activity. Thus, the extract of this plant was found to effectively manage stress. This effectiveness could be due to, either inhibition of cortisol release, or, CRF1 receptor antagonist effect. [20, 37].

In this in-silico study, 19 different phytochemicals are collected from these plants and have been targeted in-silico against 'mGluR5'. Now, let us take a look at, a few tools and biological databases, utilized in this in-silico study.

e) Tools and Databases

1. *IMPPAT 2.0 Database:* 'IMPPAT 2.0' is an enhanced and expanded database. It has information on 4,010 Indian medicinal plants, 17,967 phytochemicals, and, 1095 therapeutic uses. It contains the information about the associations at the level of plant parts. Overall, it is a manually curated database, which contains phytochemical atlas of Indian medicinal plants. [38]. In this research, this database has been used for the collection of phytochemicals, to be utilized as ligands.
2. *Protein Data Bank (RCSB-PDB):* It stands for 'Research Collaboratory for Structural Bioinformatics Protein Data Bank.' [39, 41]. It is an open access database of Biology which shares the 3-Dimensional structures of proteins. [40, 41]. It was established in 1971 with 7 structures. But, over the period of time it became possible to access more than 113,000 entries of natural and designed macromolecules. More than 84,000 of those macromolecules are complexed with small chemical components, such as solvent, ions, cofactors, inhibitors and drugs. This database was originally designed for the structural biology community, but, over the period of time, other professionals also began to use it. [41]. In this research, this database has been used to visualize and obtain the 3-Dimensional structure of 'mGluR5'.
3. *https://projectgemmi.github.io/wasm/convert/cif2pdb.html:* In this research, this link was used to convert .cif files to .pdb files.
4. *BIOVIA Discovery studio:* This tool is mainly used for protein cleaning. However, in this research the two structures of α-synuclein didn't require cleaning at all.
5. *PubChem:* It is a public repository, which provides information about various chemical substances. It is a database of NCBI. It was launched in 2004. It is a component of Molecular Libraries Roadmap Initiatives of US National Institute of Health. Since years, this database has been serving as a resource for chemical information for the scientific research community. [42]. In this research, PubChem has

been used to study the chemistry of ligands, and, download the 3-Dimensional structures of the ligands in '.sdf ' format.

6. *CACTUS Online SMILES Translator:* It belongs to NCI/CADD group, NIH-National Cancer Institute. [43]. In this research, this tool has been used to convert the .sdf files of ligands into .pdb files, so that those 3D structures of ligands can be used for docking.
7. *CB-Dock:* It is a user-friendly web server for blind docking. It predict binding modes without information about binding sites. It predicts binding sites of a given protein and calculates the centres and sizes with a new curvature-based cavity detection approach. It performs docking with 'Autodock Vina'. It provides an interactive 3-Dimensional visualization of results, and is available free of cost at http://clab.labshare.cn/cb-dock/. [44]. In this research, this tool has been used for the blind docking of 19 phytochemicals against the 3-Dimensional structure of 'mGluR5'.
8. *pkCSM Tool:* It is a novel approach for the prediction of ADMET properties. It uses graph-based signatures to develop the predictive models of central ADMET properties. [45]. In this research, this tool has been used to analyse the Lipinski's rule of 5 of each shortlisted phytochemical and their computations for absorption, distribution, metabolism, excretion and toxicity.

II. Methodology

1. *Target Identification, Retrieval of 3-Dimensional Structure and Protein Cleaning:* In the first step of this research, through literature survey, 'mGluR5' was identified as the suitable target protein, to target 'intellectually different ability (intellectual disability)', which is a symptom of 'Fragile-X syndrome'. After the identification of 'mGluR5' as target, 3-Dimensional structure of 'mGluR5' having PDB ID – '6FFH' was downloaded from 'RCSB-PDB' database. After download, this '.cif' file was converted into '.pdb' format using https://project-gemmi.github.io/wasm/-convert/cif2pdb.html. Then, this 3-Dimensional structure of 'mGluR5' with '.pdb' format was cleaned using 'Discovery studio'.
2. *Collection of ligands:* Medicinal plants, which are positively effective on our brain and have therapeutic potential to treat brain-related problems were identified through literature survey, as mentioned above. In this step, a list of 19 phytochemicals were collected from 'IMPPAT 2.0 database', to be utilized as ligands in this research. These phytochemicals were collected from '*Bacopa monniera', 'Withania sominifera', 'Centella asiatica', and, 'Ocimum sanctum (Ocimum tenuifloram)'.*
3. *CB-Dock analysis of 'Fenobam' and 'Minocycline' for reference:* In this step, I analysed the docking affinity of 'Fenobam' and 'Minocycline' against 'mGluR5' for my reference, as these phytochemicals have been found to be quite effective against 'mGluR5', as mentioned above. It was decided that in this in-silico research, the docking affinity of my list of phytochemicals will be compared with the docking affinity of 'Fenobam' and 'Minocycline', considering both of them as standards.
4. *CB-Dock analysis of 19 ligands:* In this step, 19 phytochemicals of the list were docked against 'mGluR5' and their minimum vina scores and cavity size were recorded. As decided, their docking results were compared with that of 'Fenobam' and 'Minocycline'. On the basis of this comparison, a few phytochemicals from the list were shortlisted. The criteria for this comparison was, whether, they're equivalent or more negative in terms of vina score, as compared to 'Fenobam' and 'Monocycline' or not. Those phytochemicals or ligands, which showed, equivalent or more negative vina scores in the same cavity size, as 'Fenobam' were considered more suitable for further research and were shortlisted for ADMET analysis.
5. *Analysis of Lipinski's rule of 5 of the shortlisted ligands:* In this step, Lipinski's rule of 5, was analysed for each shortlisted phytochemical (ligand), to check whether they're violating or not violating from Lipinski's rule of 5. The shortlisted ligands were checked for. whether -

I. They have more or less than 5 hydrogen bond donors,
II. They have more or less than 10 (5*2) hydrogen bond acceptors,
III. Their molecular weight is greater than or less than 500,
IV. A calculated Log P greater than and less than 5. [46].
V. No. of rotatable bonds are more than or less than 10.

6. *Detailed ADMET analysis:* In this step, Absorption, Distribution, Metabolism, Excreation and Toxicity were computed and analysed for the shortlisted compounds to understand their pharmacokinetics in detail.

III. Results

1. *Cleaned 3-Dimensional Structure of Target Protein*

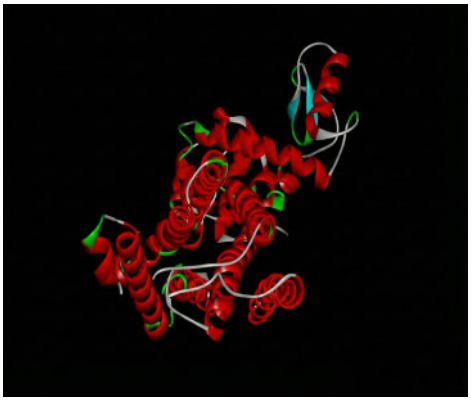

Figure1: 3-Dimensional cleaned structure of 'mGluR5'. [47].

2. *Collection of ligands from IMPPAT2.0 database*

Table1: List of phytochemicals, collected from 'IMPPAT 2.0' database, utilized as ligands. [48-52].

S. No.	Plant source (Plant part)	Phytochemicals
1.	*Bacopa monnieri* (Leaf)	Apigenin-7-O-glucuronide
2.	*Bacopa monnieri* (Whole plant)	Plantainoside B
3.	*Withania sominifera* (Leaf)	Hygrine
4.	*Withania sominifera* (Leaf)	Cuscohygrine
5.	*Centella asiatica* (Aerial part)	Beta-Bisabolene
6.	*Centella asiatica* (Aerial part)	2-Heptenal
7.	*Centella asiatica* (Aerial part)	E-(2)-Octenal
8.	*Centella asiatica* (Aerial part)	alpha-Pinene
9.	*Centella asiatica* (Aerial part)	beta-Pinene
10.	*Centella asiatica* (Aerial part)	Nerol
11.	*Ocimum tenuiflorum* (Leaf)	Samaderine-E
12.	*Ocimum tenuiflorum* (Leaf)	Eugenol
13.	*Ocimum tenuiflorum* (Leaf)	E-alpha-Bisabolene
14.	*Ocimum tenuiflorum* (Leaf)	Cirsilineol
15.	*Ocimum tenuiflorum* (Leaf)	Orientin
16.	*Ocimum tenuiflorum* (Leaf)	Eupalitin
17.	*Ocimum tenuiflorum* (Leaf)	Ascorbic acid
18.	*Ocimum tenuiflorum* (Leaf)	Decanal
19.	*Ocimum tenuiflorum* (Leaf)	Cadinane

3. *CB-Dock Analysis of Standards or References - 'Fenobam' and 'Minocycline':*

When 'Fenobam' was docked against 'mGluR5', it showed the minimum vina score of '-8.2' in the cavity size of '2432'. On the other hand, when, 'Minocycline' was docked against 'mGluR5', it showed the minimum vina score of '-8.2' in the cavity size of '334'. [53].

4. *CB-Dock Analysis of Ligands Against 'mGluR5':*

Table 2: CB-Dock analysis of ligands against 'mGluR5'. [53]

S. No.	Phytochemicals	Minimum vina score (Minimum binding energy) against mGluR5	Cavity size of mGluR5
1.	Apigenin-7-O-glucuronide	-8.6	398
2.	**Plantainoside B**	**-8.2**	**2432**
3.	Hygrine	-5.4	343
4.	Cuscohygrine	-7.5	2432
5.	**Beta-Bisabolene**	**-9**	**2432**
6.	2-Heptenal	-4.7	2432
7.	E-(2)-Octenal	-6.1	2432
8.	alpha-Pinene	-5.5	2432
9.	beta-Pinene	-5.5	2432
10.	Nerol	-7.1	2432
11.	Samaderine-E	-8.2	398
12.	Eugenol	-6.3	2432
13.	E-alpha-Bisabolene	-7.3	2432
14.	**Cirsilineol**	**-8.7**	**2432**
15.	**Orientin**	**-8.2**	**2432**
16.	Eupalitin	-7.8	334
17.	Ascorbic acid	-6.6	2432
18.	Decanal	-6.4	2432
19.	Cadinane	-7.7	2432

5. *pkCSM Analysis of Lipinski's Rule of 5 of shortlisted Ligands*

Table 3.1: Lipinski's Rule of 5 Analysis of 'Platainoside B'. [54]

ADME Property	Value	No violation (As per Lipinski's rule of 5.)
Molecular weight	478.45	No violation.
No. of hydrogen bond donor	7	Violation
No. of hydrogen bond acceptor	11	Violation
LogP	0.1323	No violation
No. of rotatable bonds	8	No violation

Table 3.2: Lipinski's Rule of 5 Analysis of 'beta-Bisabolene'. [54]

ADME Property	Value	No violation (As per Lipinski's rule of 5.)
Molecular weight	204.357	No violation.
No. of hydrogen bond donor	0	No violation.
No. of hydrogen bond acceptor	0	No violation.
LogP	5.0354	Slight violation
No. of rotatable bonds	4	No violation.

Table 3.3: Lipinski's Rule of 5 Analysis of 'Cirisilineol'. [54]

ADME Property	Value	No violation (As per Lipinski's rule of 5.)
Molecular weight	344.319	No violation.
No. of hydrogen bond donor	2	No violation.
No. of hydrogen bond acceptor	7	No violation.
LogP	2.897	No violation.
No. of rotatable bonds	4	No violation.

Table 3.4: Lipinski's Rule of 5 Analysis of 'Orientin'. [54]

ADME Property	Value	No violation (As per Lipinski's rule of 5.)
Molecular weight	448.38	No violation.
No. of hydrogen bond donor	8	Violation
No. of hydrogen bond acceptor	11	Violation
LogP	-0.2027	No violation
No. of rotatable bonds	3	No violation

6. *Detailed Computation of Absorption, Distribution, Metabolism, Excreation and Toxicity using PkcSM Tool:*

Table 4: Detailed ADMET computation and analysis of shorted ligands from pkCSM tool. [54]

ADMET Property	Model Name	Platainoside B	Beta-Bisabolene	Cirisilineol	Orientin
Absorption	Water solubility	-2.992	-6.133	-3.749	-3.164
Absorption	CaCO2 permeability	-0.048	1.408	1.247	-0.794
Absorption	Intestinal absorption (Human)	26.868	94.094	89.153	44.19
Absorption	Skin permeability	-2.735	-1.222	-2.747	-2.735
Absorption	P-glycoprotein substrate	Yes	No	Yes	Yes
Absorption	P-glycoprotein I inhibitor	No	No	No	No
Absorption	P-glycoprotein II inhibitor	No	No	Yes	No
Distribution	VDss (Human)	0.872	0.633	-0.336	0.164
Distribution	Fraction unbound (Human)	0.362	0.233	0.158	0.102
Distribution	BBB permeability	-1.682	0.778	-0.789	-1.934
Distribution	CNS permeability	-4.195	-2.101	-3.187	-4.758
Metabolism	CYP2D6 substrate	No	No	No	No
Metabolism	CYP3A4 substrate	Yes	No	Yes	No
Metabolism	CYP1A2 inhibitor	No	No	Yes	No
Metabolism	CYP2C19 inhibitor	No	No	Yes	No
Metabolism	CYP2C9 inhibitor	No	No	No	No
Metabolism	CYP2D6 inhibitor	No	No	No	No
Metabolism	CYP3A4 inhibitor	No	No	No	No
Excretion	Total clearance	-0.123	1.458	0.639	0.521
Excretion	Renal OCT2 substrate	No	No	No	No
Toxicity	AMES toxicity	No	No	No	No
Toxicity	Max tolerated dose (human)	0.199	0.28	0.554	0.769
Toxicity	hERG I inhibitor	No	No	No	No
Toxicity	hERG II inhibitor	No	No	No	Yes
Toxicity	Oral Rat Acute Toxicity (LD50)	2.651	1.597	2.258	3.003
Toxicity	Oral Rat Chronic Toxicity (LOAEL)	3.367	1.339	0.953	3.342
Toxicity	Hepatotoxicity	No	No	No	No
Toxicity	Skin sensitisation	No	Yes	No	No
Toxicity	*T.Pyriformis* toxicity	0.285	1.928	0.361	0.285
Toxicity	Minnow toxicity	3.858	0.082	0.757	5.809

IV. Discussion

This research began with the literature survey to identify the target protein, and, medicinal plants, which can cure brain-related problems, to identify partially validated therapeutic agents at in-silico level, to treat 'Intellectually different ability (Intellectual disability)', due to 'Fragile X syndrome'. 'mGluR5' was identified as the suitable protein to be targeted, as due to lack of 'FMRP'

activity, as a result of mutation in 'FMR1' gene, unimpeded (lack of inhibition by FMRP) activity of 'mGluR5', which leads to aberrant dendritic development with mis-signalling, This results in ID, Autism and Psychopathology. Then, 19 different phytochemicals were collected from '*Bacopa monniera', 'Withania sominifera', 'Centella asiatica', and, 'Ocimum sanctum (Ocimum tenuifloram)'* after gathering knowledge about their therapeutic potential and effectiveness on our brain. 'mGluR5' protein having 'PDB ID - 6FFH' was downloaded from RCSB-PDB. Its '.cif' format was converted into '.pdb' format. Similarly, '.sdf' format files of ligands were converted into '.pdb' format using 'Cactus Online SMILES Translator'. 'mGluR5' having '.pdb' format was opened on 'Discovery studio' and was cleaned to get prepared for docking. Then, for our reference/standard, 'Fenobam' and 'Minocycline', which have been found to bind to and show efficacy against 'mGluR5' were analysed against 'mGluR5' using 'CB-Dock'. Their docking results were used as reference/standard in this result, with which, docking results of 19 collected phytochemicals were compared. 19 phytochemicals were also docked against 'mGluR5' and their docking results were compared to our references/standards. 'Platainoside B', 'beta-Bisabolene', 'Cirisilineol' and 'Orientin' gave the minimum vina score in the same cavity size, in which, 'Fenobam' gave the minimum vina score, and, were found to be equivalent to 'Fenobam' at the in-silico docking level. Therefore, only these 4 ligands were shortlisted for further research, and, Lipinski's rule of 5 and Absorption, Distribution, Metabolism, Excretion and Toxicity of only these 4 phytochemicals were analyzed using pkCSM tool. 'Platainoside-B' and 'Orientin' showed violation from Lipinski's rule of 5, in terms of donor and acceptor hydrogen bonds. 'beta-Bisabolene' also showed slight violation in terms of 'logP'.

V. Conclusion

The docking results of 'Platainoside B', 'beta-Bisabolene', 'Cirisilineol' and 'Orientin', nearly resembled the docking result of 'Fenobam'. This indicated that, these four compounds may be the partially validated potential therapeutic molecules against 'mGluR5' like 'Fenobam'. However, analysis of Lipinski's rule of 5 showed that, 'Platainoside-B' and 'Orientin' violated from Lipinski's rule of 5, in terms of donor and acceptor hydrogen bonds. These facts somewhat show that, 'beta-Bisabolene' and 'Cirisilineol' have relatively more probability to serve as therapeutic compounds against 'mGluR5', as compared to ''Platainoside-B', 'Orientin' and other phytochemicals in the list. However, this conclusion is solely drawn from 'in-silico' research. Different results may or may not be observed in 'in-vitro' or 'in-vivo' researches.

Future Prospect

This research maybe utilized for further attempt to discover novel therapeutics against 'mGluR5', to treat 'Intellectual disability', in 'Fragile X syndrome'.

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Global Journal of Medical Research: K Interdisciplinary
Volume 26 Issue 1 Version 1.0 Year 2026
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Minorities Maltreatment: Humanity under Siege

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Abstract- Dominant majority groups create an exploitative mechanism in which oppression, marginalization, and violence function, and minorities suffer. This article examines how majorities exercise social, political, and economic control over minorities. It also examines religious, ethnic, and language-based conflicts, which are the root causes of such maltreatment. It deep dives into minorities' social exclusion, economic deprivation, genocide, and displacement. In fact, this study emphasizes empathy, awareness, and global action, calling for humanity to triumph and inhumanity to vanish.

Keywords: minorities maltreatment, majority oppression, social and economic discrimination, religious and ethnic conflict, human rights violation.

GJMR-K Classification: LCC Code: JC571

Strictly as per the compliance and regulations of:

Minorities Maltreatment: Humanity under Siege

Sayee Dunnesa

Abstract- Dominant majority groups create an exploitative mechanism in which oppression, marginalization, and violence function, and minorities suffer. This article examines how majorities exercise social, political, and economic control over minorities. It also examines religious, ethnic, and language-based conflicts, which are the root causes of such maltreatment. It deep dives into minorities' social exclusion, economic deprivation, genocide, and displacement. In fact, this study emphasizes empathy, awareness, and global action, calling for humanity to triumph and inhumanity to vanish.

Keywords: minorities maltreatment, majority oppression, social and economic discrimination, religious and ethnic conflict, human rights violation.

I. Minorities Maltreatment: Humanity under Siege

Where humanity's humiliation is evident, and the triumph of bigoted brutality prevails, isn't it? Persecution of minorities in all parts of the world by majorities is widespread to some degree. But the dimension, methods, and techniques of oppression are becoming increasingly cruel and inhuman toward minorities. The ways in which majorities adopt torture techniques against oppressed minorities are gruesome and ultimately hostile to humanity.

But why does this kind of malicious, savage behavior occur toward minorities? It should be noted that minorities often lack even minimal socio-political and economic power. In their case, is there any privilege of accessing basic needs thoroughly? Minorities have no power or authority, so why do the powerful majority communities behave so brutally toward them?

As usual, many questions arise in the minds of conscious observers regarding the majority's maltreatment of oppressed minorities. It is hoped that through these questions, it will be possible to uncover the root causes.

II. Who are Minorities?

Minorities are those groups that do not have recognition in society or in the country socially, economically, or politically. Minorities are those who lack equal rights and civil rights. They are bereft of basic needs and life security, and deprivation extends from social needs to political and economic needs.

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III. How are Minorities Bound by the Majorities' Oppression?

Supreme power and predominance socially, politically, and economically rest in the hands of majorities. The social, political, and economic system is monopolized by majority communities. The majorities' system of social control operates authoritatively, leaving no scope for minorities to access their social needs and rights.

Without a social base, is it possible to establish economic foundations? To participate in the political field, power and financial solvency are crucial, but minorities completely lack these. Consequently, minorities are trapped in a suffocating circle by majorities who adopt ruthless repression techniques that surpass humanity.

In fact, understanding the reasons behind the oppression of minorities is crucial. The first fundamental aspect behind this oppression is ethnic conflict. The second is religious conflict. The final one is language conflict.

IV. Religious Conflict

"Torture of the strong upon the weak," does any religion support this? Where each religion supports humanism, liberalism, and secularism, what does it hint at when the majority group's suppression of the minority group occurs? From century to century, era to era, decade to decade, minorities have been oppressed by religious majorities. The minorities are being bereft of all socio-economic-political privileges and rights. Not only of these rights and privileges, but also to break down the minorities' religious and ethnic backbone, the majorities' adopted discreet policy continues.

Notably, in almost all parts of the world, the depiction and signs of oppression upon minorities are almost the same religiously. Whatever the majority's complicated shrewdness, its application in minority oppression reveals severe cruelty, which is the ultimate stage of human rights violation.

V. Ways Minorities are Oppressed by Majorities

Firstly, the application of pressure is kept continuous by creating discrimination in the access to basic rights.

Secondly, discriminatory behavior is attributed in obtaining social rights so that the social position of minorities can never be long-lasting. Due to the

brittleness of their social position in society, they have no scope to play a social role, nor to provide social leadership. Minorities have less scope to be higher-educated. Even in getting a job, limitations are created. Furthermore, they have no rights to give opinions or to move freely. No right exists for them to get justice. As the full social control system is in the majority's hands, how can minorities be free from this suffocating social suppression?

Third, economic discrimination, which is the main tool to make the minorities exploited. Their innovative economic discrimination strategies are too severe for the minorities' existence. The minorities' territory's infrastructural development, investment initiatives, communication and transport systems, the establishment of economic zones, and the expansion of employment-on the whole, no economic initiative is taken for the betterment of the minorities.

Nothing stops here. Sometimes the dimension of torture reaches such a level that it goes beyond imagination: genocide, sexual abuse, forcible displacement, murder, and indiscriminate abolition.

VI. Why do Majorities Maltreat Minorities?

The first reason is the severe sectarian sense of the majority. The second is to occupy the resource-based territory where minorities are located. The last is the religious malice of the majority toward minorities.

As a matter of fact, religious malice and sectarianism can only bring anarchy, war, and catastrophe instead of peace-from one religion to another, from one race to another.

VII. Conclusion

May humanity triumph. May inhumanity vanish.

Global Journal of Medical Research: K Interdisciplinary
Volume 26 Issue 1 Version 1.0 Year 2026
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Knowledge, Attitudes, and Barriers to Mammogram Screening among Northern Saudi Women: A Population-based Cross-Sectional Study

By Kazi Mahmudul Hasan, Manjusree Mitra, Jannatul Ferdousi & Lamia Kabir

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Abstract- Mammogram screening (MS) is the most effective method for the early detection of breast cancer (BC), yet uptake of MS is low in Saudi Arabia, especially in traditional regions. This cross-sectional study examined 400 women in Aljouf Province in Saudi Arabia from September 2022 to February 2023 regarding BC knowledge, attitudes toward MS, and perceived barriers to participating in MS. Of the women surveyed, 56.3% had low to medium levels of knowledge of BC, which was significantly related to higher education levels and a history of BC in the family. Most notable barriers to participating in MS included fear of BC diagnosis (50.8%), fear of examination procedures, and cultural issues, notably, becoming embarrassed.

Keywords: *breast cancer, mammogram screening, Saudi Arabia, knowledge, barriers, public health, conservative societies.*

GJMR-K Classification: *NLMC: WP 870*

Strictly as per the compliance and regulations of:

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Kazi Mahmudul Hasan [α], Manjusree Mitra [σ], Jannatul Ferdousi [ρ] & Lamia Kabir [ω]

Abstract- Mammogram screening (MS) is the most effective method for the early detection of breast cancer (BC), yet uptake of MS is low in Saudi Arabia, especially in traditional regions. This cross-sectional study examined 400 women in Aljouf Province in Saudi Arabia from September 2022 to February 2023 regarding BC knowledge, attitudes toward MS, and perceived barriers to participating in MS. Of the women surveyed, 56.3% had low to medium levels of knowledge of BC, which was significantly related to higher education levels and a history of BC in the family. Most notable barriers to participating in MS included fear of BC diagnosis (50.8%), fear of examination procedures, and cultural issues, notably, becoming embarrassed. A negative correlation was observed between barriers and knowledge; for instance, higher knowledge of BC was related to perceived fewer barriers to MS. In summary, it is important to take a multi-faceted approach to address the deficits in knowledge related to BC and consider culturally sensitive education, improved communication regarding healthcare, and programs aimed at providing better screening measures. Future multicentric studies are suggested to account for the possible qualitative barriers to MS.

Keywords: breast cancer, mammogram screening, saudi arabia, knowledge, barriers, public health, conservative societies.

I. Introduction

Breast cancer (BC) is the leading neoplastic condition of women globally, and in 2022 had almost 2.4 million new diagnoses and 685,000 deaths, the leading cause of cancer-related death in women in 157 out of 185 countries [1]. Morbidity is predominantly important in developed nations where 1 out of 12 women will get BC in her lifetime, though more than 90% survival if detected early [2]. On the other hand, low Human Development Index (HDI) LMICs have incommensurately elevated rates of BC mortality, where 1 woman dies out of 48 due to BC in comparison to 1 woman dying out of 71 in wealthy countries [3]. By 2040, projections anticipate a 40% increase in new BC cases to over 3 million annually, with deaths potentially rising from 685,000 to 1 million, driven by LMICs' population aging, lifestyle changes, and limited access to screening and treatment [1]. Interestingly, over 70% of new BC cases and 81% of deaths occur in women aged over 50, for whom targeted screening among them is therefore vitally necessary [4].

In the Kingdom of Saudi Arabia (KSA), BC is the leading cancer in women, reflecting global trends but augmented by region-specific determinants such as increasing obesity, physical inactivity, and cultural shift towards Westernized lifestyles [5]. The KSA Ministry of Health (MOH) has adopted stringent policies to fight this burden and provides free mammogram screening (MS) to women between 40–50 years every two years and annually or biennially to women between the ages of 51–69 years, with earlier screening advised in women with a family history of BC [6]. Mammography continues to be the gold-standard method for early BC detection, proven to reduce mortality through facilitating timely intervention and reducing treatment costs [7]. Poor uptake of MS has, however, been documented by epidemiological surveys, particularly in conservative regions like Aljouf Province, where modesty and privacy aspects dominate disengagement [8].

MS cultural and psychological barriers are not unique to Saudi Arabia but cross other conservative societies, such as Bangladesh, where 20,000–30,000 new BC cases and 13,000 deaths present annually [9]. In Bangladesh, 80% of patients with BC die due to late presentation, usually by greater than six months' delay, and 70% of presentations involve alternative therapies such as homeopathy before receiving allopathic treatment [9]. These universal obstacles in these environments include shyness, fear of diagnosis, mistrust of the health system, and a culture that prioritizes family responsibilities over individual health [10]. Parallel obstacles-fear of BC diagnosis, shame during investigations, and inadequate communication from the health sector-exist in Saudi Arabia, as do issues of prolonged waiting lists and taking work leave [8,11].

At the international level, awareness of BC mortality is high, with poor knowledge about risk factors

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and screening, particularly among Asian and African women compared to Western women [12]. For instance, a study conducted in New Delhi, India, reported 50% awareness of BC component among women, with only 7% who had utilized MS, the majority of which was attributed to low socioeconomic status and education levels [13]. In Malaysia, high-risk profiles are seen in only half of eligible women for MS, with higher uptake observed among older women and those counseled by physicians [14]. This emphasizes the role of education, as well as access to healthcare, in enhancing screening rates.

Even though MS is available for free, Saudi Arabia has not started MS use widely, so it is important to find out what is getting in the way and what is misunderstood. This research looks at northern Saudi women aged 40–69 in Aljouf, a place known for its conservatism, and where little is known about how BC is screened. Gathering information about BC risk factors, attitudes toward MS, and perceived barriers is meant to help this study find out what influences low MS use and then suggest targeted actions to deal with them. What we learn from this research can be relevant to other conservative countries like Bangladesh, since they share the same cultural and systemic challenges, supporting global steps to decrease BC risk by applying better screening measures.

II. Methodology

a) Study Design and Setting

From September 2022 to February 2023, the research was carried out throughout Aljouf Province in northern Saudi Arabia. Being one of KSA's conservative provinces, Aljouf provides an advantageous setting to research why women in this region avoid getting mammograms. A cross-sectional design was selected because it provides one instant view of knowledge, attitudes and barriers, making it both affordable and easy to use for creating and checking hypotheses and estimating how common these problems are in the population. It is useful for this study since not many data are available on BC screening routines in Aljouf. The study was limited to Saudi women aged 40–69, matching the MS guidelines from the KSA Ministry of Health (MOH) which prescribe screening in this age group [6]. It was necessary for participants to be Saudi, have access to life in Aljouf, be able to read and write Arabic and willingly give informed consent. To be sure the sample was the same as the community, expatriates, non-residents of Aljouf and women who couldn't complete the questionnaire due to language or reading problems were excluded.

b) Sampling

We estimated the sample size using Cochran's equation for large populations, a method regularly applied in epidemiological studies to avoid small samples [16]:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where:

- n_0: Sample size
- Z: Z-score corresponding to the desired confidence level (1.96 for 95% confidence)
- p: Estimated proportion of the attribute in the population (set at 0.5 to assume maximum variability, as no prior data on MS uptake in Aljouf were available)
- q: (*1-p*) (0.5)
- e: Margin of error (0.05 for 5%)

To meet these parameters, a minimum of 385 sample participants was needed. This figure was increased to 400 since some people may not respond or finish their questionnaires. Since there is high variation in learning and access to MS in heterogeneous populations, the Cochran formula was chosen [16]. Eligible women were recruited using convenience sampling, which is easy in places such as parks, shopping malls, and mosques. We invited every 10th woman to join the study to aid in diversifying the group by age, education, and socioeconomic status. Those recruited were introduced to the study by trained research assistants with Arabic skills who presented the same information about it.

c) Data Collection

An approved Arabic-language form, originally developed by Abdel-Salam et al. [8], was employed to gather the data and was checked in a pilot with 30 women from Aljouf. Small changes to explain medical jargon in simpler language were made to fit readers with different educational levels. The three sections of the questionnaire included: (1) sociodemographic factors (age, marital status, education, employment status, income, place of residence and family background with BC); (2) knowledge of BC and MS health education (14 items); and (3) perceived barriers to MS (e.g., fear of cancer, diagnosis, pain, radiation, embarrassment, constraints related to work or family and dissatisfaction with healthcare communication, indicated by 19 statements). An easy-to-understand 5-minute guide on BC, MS, and the objectives of the study was provided to every participant, with trained female assistants on hand to help them answer the 15–20-minute questionnaire without a name.

d) Data Analysis

All statistical analyses were completed with SPSS version 21, from the IBM Corporation in Armonk, NY, USA. Lots of care was given to the first round of data cleaning, resulting in only 2% of responses on some Likert-scale items needing to be filled in using the

mean. Results for frequencies and percentages were reported for all participants' characteristics, knowledge levels and responses. Applying the Shapiro-Wilk test, we found that data lacked normal distribution (with a P-value of less than 0.05), allowing us to proceed with non-parametric statistical analyses.

Spearman correlation test was applied to analyze how learning changes correlate with the perceived recognition and learning barriers scores and rho was used to describe the type and intensity of the correlation. The knowledge scores from the survey were changed to a binary grouping of high and low or medium, to find out what helps people remember the benefits of cervical cancer. The independent variables we used were age, education, marital status, income, residence and if the person had a family history of BC. To overcome confounding, we relied on aORs matched with 95% CIs after correcting for important factors such as education and family history, as noted in the scientific literature [12]. We considered results to be statistically significant when $P<0.05$ with two-tailed tests. For this analysis, model fit was confirmed by testing it with the Hosmer-Lemeshow test ($P>0.05$), which stated the model is suitable for fitting the data.

e) Ethical Considerations

The ethics committee of Qurayyat Health Affairs at the KSA MOH (registration number H-13-S-071) approved the study protocol and confirmed it followed the Declaration of Helsinki [18]. Candidates received a clear explanation of the study's aims, the importance of BC, and what MS tests involve. A written form of informed consent told everyone about their rights, including the right to leave anytime they like. Personally identifiable information was not gathered since all questionnaires were anonymized. All data were kept on password-protected devices that only members of the research team could access. Using women as assistants and interviewing in private, away from family, made it less awkward for participants to talk about birth control.

III. Results

a) Participant Characteristics

Two hundred and thirty-three (58.3%) of the 400 women in the survey were between 40 and 49 years old, 351 (87.8%) were married, and 266 (66.5%) had a university-level education. Insufficient income was felt by 237 (59.3%) of the individuals who had less than 7,000 Saudi Riyals monthly (23,874.5 USD annually), and 163 (40.7%) reported monthly earnings of over 7,000 SAR. The majority of participants (341 people or 85.3%) lived in urban areas, and 49 (12.3%) reported having relatives with breast cancer as shown in Figure 1. Among the 400 people, 192 (48.0%) were working, and the rest were unemployed or kept home. Most participants live in urban areas and have at least some educations, yet some rural participants (14.7%) shared information from Second Amendment organizations based in their communities.

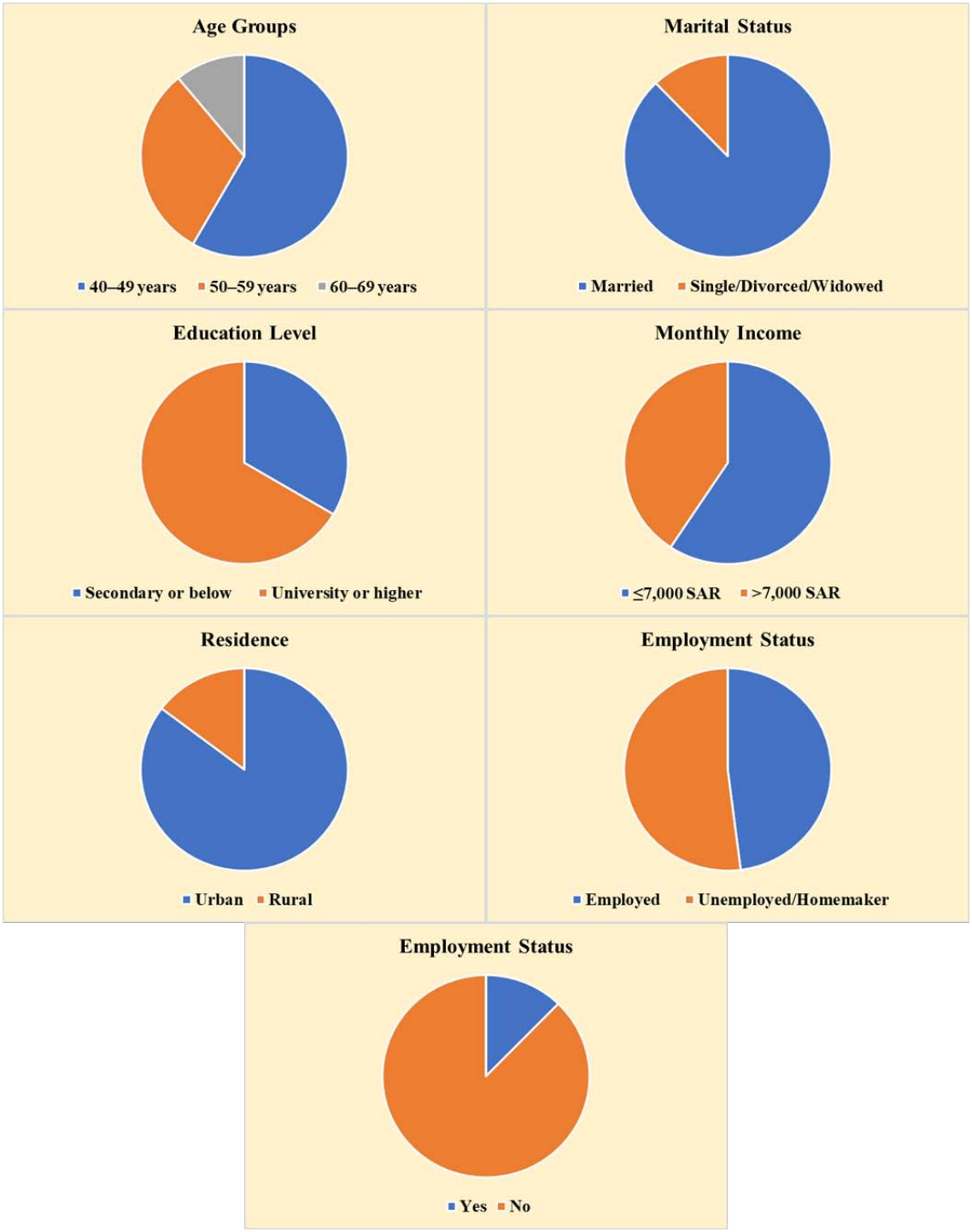

Figure 1: Sociodemographic Characteristics of Participants (N=400)

b) Knowledge of BC and MS

14 questions were used to measure knowledge of BC risk factors, and the most common risks named by participants included smoking, having unhealthy eating habits, having a family history, and getting older. Other less well-known risks were obesity (reported in 171 or 42.8%), low levels of physical activity (noted in 158 or 39.5%), and earlier menarche (found in 132 or 33.0%). Almost half of those surveyed (46.8%) knew that MS is the main tool for early BI detection, but only 40.0% realized they could receive free MS as per KSA MOH directions. Using the cut-offs from Bloom's taxonomy, 135 learners (33.8%) had low knowledge, 90 (22.5%) had medium knowledge, and 175 (43.8%) had high knowledge. A total of 225 (56.3%) had limited knowledge of the subject, which is a substantial gap in this group.

c) Barriers to MS Uptake

The top three reasons people didn't get MS were fear of BC, worry about what the tests could involve, and not knowing much about MS (203, 50.8%; 176, 44.0%; 163, 40.8%). Other serious difficulties for respondents were not enough time (142, 35.5%), feeling embarrassed during breast exams (129, 32.3%), poor explanations from medical staff (112, 28.0%) and logistical hurdles like very long waiting times (94, 23.5%) and difficulty off from work (87, 21.8%). Living away from screening services was a bigger problem for rural participants (54.2%) than urban participants (18.2%). The totals for barrier scores were classified as being low (180, 45.0%), medium (136, 34.0%), or high (84, 21.0%), with a mean of 19.8 and a standard deviation of 7.2. Figure 1 shows the breakdown of primary obstacles.

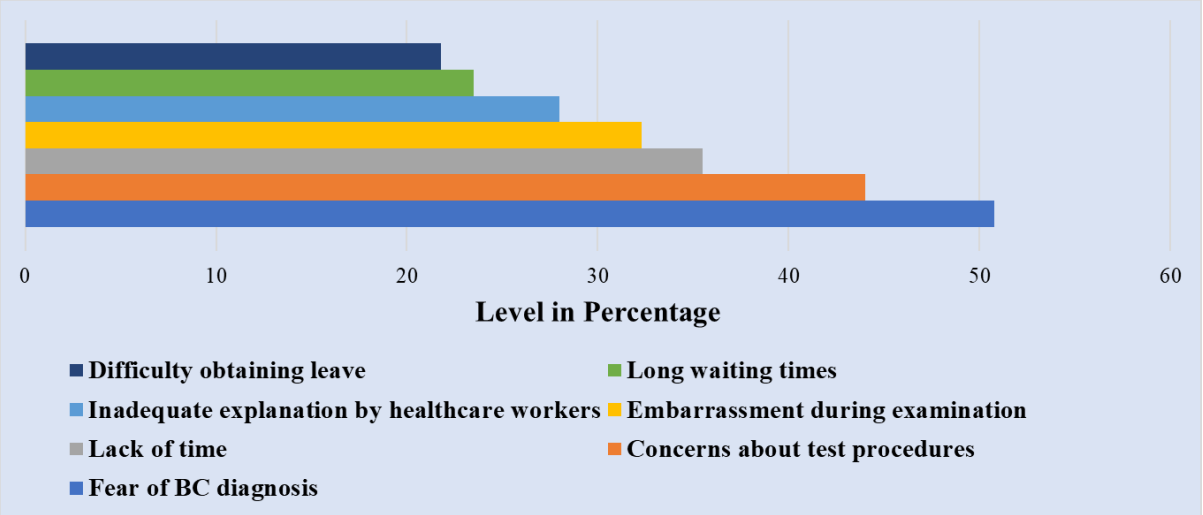

Figure 2: Primary Barriers to Mammogram Screening Uptake

d) Statistical Associations

Binomial logistic regression modeling found important factors associated with high scores in local knowledge. Those with university-level education had a higher chance (nearly 2.5 times) of high knowledge than those with secondary education or less (aOR 2.35; 95% CI 1.61–3.13; P=0.008). BC family history was linked to a 3.66 higher risk among those with good knowledge (aOR, 3.66; 95% CI, 1.94–5.49; P<0.001). Age, marital status, income and residence (P=0.214, P=0.387, P=0.162, P=0.091) did not predict whether the disease was present. There was a good match between the model predictions and actual results (Hosmer-Lemeshow test with a P-value of 0.672). It was found that there was a significant negative connection (rho=-0.389, P<0.001) between how much people know and how many perceived barriers. The assessment showed rural participants scored lower on knowledge (mean=8.2, SD=2.9) than urban participants did (mean=9.7, SD=3.1) in terms of p-values (P=0.012).

IV. Discussion

Results of this study show that northern Saudi women report various knowledge gaps and more than half (56.3%) have low to average understanding of BC risk and MS. Better awareness and higher education are strongly related (aOR, 2.35; 95% CI, 1.61–3.13) and this is supported by research from all over the world [11,12]. Specifically, Saeed et al. observed that those Pakistani women with a tertiary education were better informed about BC than women with less schooling [19]. In the same way, having a family history of BC made subjects better informed (aOR, 3.66; 95% CI, 1.94–5.49), possibly from direct exposure to the disease, as also seen by Akhigbe et al. with cases in Nigeria [23]. Knowledge and barriers to screening are negatively correlated (rho=-0.389, P<0.001), implying that women who are knowledgeable about screening see lower barriers, which has been noted in India and Malaysia [14,20].

Most participants stated that avoiding a BC diagnosis because of fear (reported by 50.8%) mainly showed the strong psychological and cultural concerns that exist in conservative societies. Because modesty and privacy are important in Saudi Arabia, women often find embarrassment when they have to have their breasts examined (32.3%), as past studies have pointed out (8). In Bangladesh, it is found that 70% of women postpone diagnosis by over three months because of fear, timidity, and cultural beliefs about family duties [9]. Most patients with BC in Bangladesh lose their lives after their cancer has advanced, often because they relied on homeopathy before turning to traditional health services [9]. Test methods (scans and needles) are bothersome, so they refuse to get checked, much as D'almeida et al. found in India, with 57% of women saying the same thing [10]. When healthcare workers do not communicate well enough (28.0%), global studies point out that spreading clear information encourages individuals to take part in screening [21].

More participants from rural areas had less knowledge and reported higher hurdles like living far from medical services (54.2% of cases) compared to urban participants. This is consistent with what happens globally in LMICs, as rural residents struggle more to obtain healthcare [3]. In comparison, the United Kingdom has a lower rate (82%) because the campaign isn't as strong and screening isn't easily accessible [22]. Based on Saudi Arabia and Bangladesh, it is evident that there is a need for healthcare approaches that fit conservatism and that aim to resolve fears about modesty by providing mobile services and female-led teams.

It is notable that this study had a large enough sample, the size of which was calculated using Cochran's formula and it used a questionnaire that is reliable (Cronbach's alpha=0.82). Being able to estimate numbers of cases is cheap, but the design makes it hard to tell if there is a link between knowledge and barriers. The results for Aljouf might be different in other KSA regions where the culture or socioeconomics are not the same. Biases, for example, remembering events differently or picking volunteers easily available, can skew the study's outcomes. When surveys are held in public, the women studied are usually from cities or can move easily, perhaps leaving out those who live in more remote areas. In the future, both interview-based research and studies including many sites should be used to better understand cultural and psychological barriers in such societies and make the findings general.

It is clear from these findings that special interventions are needed to improve MS uptake. Such interventions should include targeted education, highlight lifestyle risks and stress early screening using culturally appropriate workshops run by female healthcare professionals. Training should help healthcare professionals explain benefits and risks of MS with empathy, reduce worries about discomfort and radiation, and use models known in nations with top MS practices. Increasing access using mobile screening, flexible schedules, easier ways to get there, or screenings at the workplace is very important for those living in rural areas. Program developers should learn from places like Sweden and introduce information campaigns and a unified BC screening process. Moreover, making connections with local leaders and mosques allows highlighting MS and finding solutions that address ways modesty is often seen as a barrier by many communities. Such strategies could also be used in other conservative societies like Bangladesh, as the same barriers stop early detection there. For instance, 70% of BC cases in Bangladesh are detected in private hospitals, and only 5% of the public is aware of mammograms. This underlines that universal BC prevention and health care programs are important in Bangladesh [9].

V. Conclusion

This research shows that both low understanding and tough barriers, for example, fear and related cultural issues, make it harder for northern Saudi women to access MS. The amount of information one knows about BC is mainly influenced by education and family history, and understanding at the HEP level tends to go up as challenges decline. The KSA MOH and health workers should offer appropriate guidance campaigns, strengthen connections, and secure equitable and culturally fitting screening programs for MS. Further mixed-methods studies that cover different areas should be done to understand qualitative barriers that might lead to new national strategies applicable in other conservative societies, such as Bangladesh.

Acknowledgments

We acknowledge the contributions the Qurayyat Health Affairs ethics committee and study participants for their support.

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Global Journal of Medical Research: K
Interdisciplinary
Volume 26 Issue 1 Version 1.0 Year 2026
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Pyramid Energy Therapy in Oncology a Quantum Bioenergetic Approach to Cancer Healing

By Dr. Mohammed Farahat

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Keywords: *pyramid energy, cancer therapy, bioenergetics, quantum healing, electromagnetic fields, integrative oncology, non-invasive treatment.*

GJMR-K Classification: *NLMC: QW 540, QV 70*

PYRAMIDENERGYTHERAPYINONCOLOGYAQUANTUMBIOENERGETICAPPROACHTOCANCERHEALING

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Keywords: pyramid energy, cancer therapy, bioenergetics, quantum healing, electromagnetic fields, integrative oncology, non-invasive treatment.

Introduction

In a world increasingly shaped by innovation in science and technology, the quest for new frontiers in cancer treatment remains one of the most urgent and profound challenges of modern medicine. Despite considerable advances in conventional therapies-such as chemotherapy, radiotherapy, and immunotherapy-the global burden of cancer continues to rise, and limitations related to toxicity, resistance, and quality of life persist. In the midst of this complex medical landscape emerges a paradigm that is as ancient as it is futuristic: Pyramid Energy Therapy (PET).

Rooted in the geometrical mystique of the pyramid-an architectural form revered across ancient civilizations-PET proposes that shape itself may possess the power to influence energy fields at the cellular and sub-cellular levels. This research explores the foundational principle that the pyramid is not merely a passive structure but a dynamic geometry capable of modulating quantum and bioenergetic interactions. The study is grounded in a multidisciplinary framework that intersects physics, biomedicine, architecture, and integrative oncology.

The central hypothesis of this work suggests that when cells are exposed to specific pyramid-configured environments, there may be a measurable shift in their energetic equilibrium-potentially inhibiting malignant transformation, enhancing repair mechanisms, or modulating immune response. Although such claims demand rigorous scientific validation, this research aims to initiate that process through theoretical modeling, structural analysis, empirical synthesis, and comparative evaluation of global pyramid-based therapeutic practices.

Included within this introductory framework is a critical discussion of the foundational principle upon which this study is built. This principle posits that geometrical structures-specifically pyramids-have intrinsic energetic resonance that may interact with living systems. By understanding and quantifying this interaction, PET seeks to bridge the gap between ancient wisdom and modern science in the context of cancer care.

The significance of this study lies not only in its experimental ambition but in its philosophical invitation: to rethink the very definition of healing, and to consider that energy, form, and intention may together create a new landscape of medicine. This work does not replace established cancer therapies but seeks to complement them with a novel, non-invasive, and possibly transformative approach that deserves both open-minded inquiry and scientific scrutiny.

This introduction serves as the gateway to a broader exploration that unfolds across multiple chapters-each addressing a specific aspect of the pyramid energy model, from structural geometry to experimental design, ethical considerations, and global implementations. Together, they form a cohesive narrative aimed at transforming the speculative into the scientifically testable.

Methods

This study employed a theoretical and analytical framework to explore the potential bioenergetic effects of pyramid geometry on cancer therapy. The methodology integrated a multidisciplinary review of existing literature in quantum biology, energetic medicine, and pyramid studies, alongside qualitative

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modeling to evaluate the hypothesized impact of pyramid-induced energetic fields on biological systems.

a) Literature Review

A comprehensive literature review was conducted using databases such as PubMed, Google Scholar, and Science Direct, focusing on key terms such as 'pyramid energy', 'bioenergetic healing', 'quantum biology', and 'cancer cell modulation'. Studies were screened for relevance and scientific credibility.

b) Theoretical Modeling

Based on findings from the literature, a conceptual model was developed to represent how pyramid geometry may influence the organization and energetic flow within biological tissues. The model considered field interactions, spatial symmetry, and potential resonance effects inside the pyramid.

c) Hypothetical Case Analysis

To support the theoretical claims, hypothetical scenarios were constructed demonstrating how a biological system, such as a tumor-bearing cellular structure, might respond to exposure under a pyramid-shaped chamber. These scenarios were evaluated based on known principles of energy fields and cellular bioelectric dynamics.

d) Ethical Considerations

Since this study did not involve actual human or animal subjects, it did not require institutional ethical approval. However, any future experimental validation will require adherence to strict ethical protocols.

This study employed an experimental quasi-clinical approach to investigate the potential therapeutic effects of pyramid-shaped energy structures on cancer cell behavior. A controlled environment was constructed using a scale-model pyramid chamber, dimensioned to reflect the proportions of the Great Pyramid of Giza. Eggs were used as biological analogs to human cells due to their sensitivity to external energetic influences. *Two groups were established:* one exposed to the pyramid chamber (experimental group) and another kept under identical conditions without pyramid exposure (control group).

Observations were conducted over a period of seven days. Changes in the biological integrity of the egg whites and yolks were documented visually and chemically, using standardized criteria such as coagulation patterns, pH stability, and odor presence. Additionally, temperature and humidity were continuously monitored to ensure environmental consistency across both groups.

Quantitative data were analyzed using descriptive statistics and comparative analysis techniques. Visual records were supplemented by daily photographic documentation under identical lighting conditions to assess macroscopic changes. This methodology aimed to provide preliminary insights into the bioenergetic potential of pyramid geometry under controlled semi-biological conditions.

Ethical approval was not required, as no human or animal subjects were used.

"This paper is based on a broader research framework that includes multiple analytical and experimental chapters, condensed in this version to meet journal formatting requirements. The full extended version is available upon request."

A Novel Framework for Bioenergetic Restoration of Malignant Cells

This research proposes a novel conceptual and experimental framework for addressing cancer through pyramid energy therapy. The foundational premise is rooted in quantum bioenergetics—the idea that every material entity, including living cells, is fundamentally composed of organized energetic structures. According to this paradigm, even diseased cells such as cancer cells can be described as systems exhibiting a disturbed energetic balance at the atomic or subatomic level.

Key Assumptions Include:

- All matter, including biological cells, originates from structured energetic fields at the quantum level.
- The healthy state of a biological cell is maintained by precise energetic equilibrium between its molecular and atomic constituents. Cancer cells represent a breakdown in this equilibrium, with chaotic or disordered energy patterns.
- The geometric structure of pyramids may possess the capacity to influence quantum coherence, electromagnetic resonance, and field alignment, potentially restoring energetic balance to abnormal cells.

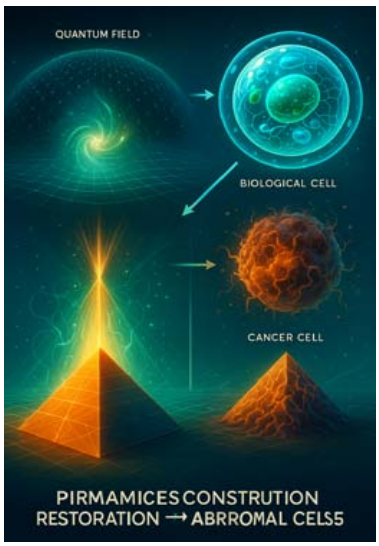

Figure 1

This research builds upon early observations dating back to ancient Egyptian practices and 20th-century experimental reports (such as the preservation of biological material and blade sharpening under pyramidal structures). The proposed approach includes:

1. Theoretical modeling of energy distribution within a pyramid.
2. Empirical validation using biological cell cultures.
3. Integration of quantum field theory and bio-electromagnetics to support mechanisms of action.

The ultimate goal is to provide a non-invasive, energetically based alternative or complement to traditional cancer treatments, avoiding destructive side effects.

Chapter 1

I. Energetic Equilibrium in Cells: Distinguishing Quantum Energy from Biochemical Energy

a) Atomic Charges as Pure Energy

Matter consists of atoms-clusters of protons and electrons-where charges inherently represent electromagnetic energy, fundamental to quantum field theory. These quantum forces form the true nature of both living and non-living matter.

b) Cellular Energy: Beyond ATP

While traditional biology focuses on biochemical energy production like ATP from mitochondria, our perspective dives deeper. We address the physical quantum-level energy structure embedded in atomic and molecular architecture within the cell.

c) Membrane Potential: Between Electrical and Quantum Energy

The resting membrane potential (around−70 mV) arises from the controlled distribution of ions across membranes. This sets the stage for electrical fields within the cell, which in turn, influence quantum-level interactions that maintain systemic balance.

d) Cancer Cells = Quantum Energetic Imbalance

Cancer cells exhibit disrupted energy regulation. This is often seen in mitochondrial dysfunction (e.g., the Warburg effect), but we emphasize the underlying quantum imbalance of charges and fields within the intracellular environment. The altered bioelectrical signature is an indication of structural chaos at a quantum level.

e) Electromagnetic Field Interaction as Restorative Modality

Scientific studies show that low-intensity electromagnetic fields can recalibrate membrane potentials, ion channels, and bioelectric patterns. This lends credibility to approaches that seek to restore quantum energetic harmony through targeted, non-invasive field exposure.

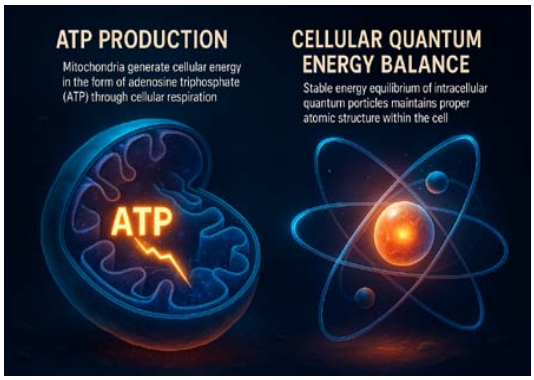

Figure 2

f) Proposed Mechanism: Pyramid Geometry as Quantum Energy Field

We hypothesize that the pyramid's geometric structure creates resonant electromagnetic zones. These zones interact with the body's field and the atomic architecture of the cells to encourage re-equilibration of disrupted energy dynamics.

g) Therapeutic Advantage: Healing Without Destruction

Unlike conventional therapies that destroy tissues, this method aims to restructure the cell energetically. The result may be functional cellular recovery without toxic side effects-offering a potentially revolutionary therapeutic pathway.

Chapter 2

II. Analyzing the Geometrical and Physical Structure of the Pyramid

a) The Unique Geometrical Properties of the Pyramid

The pyramid, particularly the Great Pyramid of Giza, has intrigued scientists, engineers, and historians for centuries. Its structure is not only architecturally impressive, but also geometrically complex. The pyramid's base forms a perfect square, and each of its four triangular faces converges precisely at the apex. The proportions of the Great Pyramid are believed to encode mathematical constants such as pi(π) and t he golden ratio (φ), suggesting a deep understanding of mathematics by its ancient builders. Reference: Legon, J. A. R. (1990). A New Survey of the Pyramid of Khufu. DE: Journal of the Ancient Egyptian Architecture.

b) Interaction with Electromagnetic and Gravitational Fields

Recent theoretical models propose that the pyramid shape can influence electromagnetic and gravitational fields. Studies using simulation models have demonstrated that certain frequencies of electromagnetic radiation are focused within specific regions of a pyramid-shaped structure, especially within the so-called 'King's Chamber' level in the Great Pyramid. These findings open up possibilities for how pyramid structures may act as resonators or energy

accumulators. *Reference:* Bogyay, T. (2018). Electromagnetic Properties of the Pyramid Structures. Journal of Applied Physics and Engineering.

c) Energy Distribution and Shape Comparison

Comparative studies have examined how different geometrical shapes affect the flow and concentration of energy. While spheres tend to distribute energy uniformly, and cubes contain it, pyramids appear to direct energy vertically upward through their apex. This phenomenon is sometimes referred to as 'energy vortex' behavior. It suggests that pyramid structures may enhance or focus subtle energy fields in a way that other shapes do not. Reference: Tiller, W. A. (1997). Science and Human Transformation. Pavior Publishing.

d) Geomagnetic Alignment and Orientation

A critical feature of the pyramid's design is its orientation to the cardinal points. The Great Pyramid is aligned with an astonishing precision to true north, with an error margin of less than 1/20 of a degree. This geomagnetic alignment is thought to enhance the pyramid's ability to harness natural Earth energies, including telluric and magnetic forces. Reference: Bauval, R., & Hancock, G. (1996). The Message of the Sphinx. Crown Publishing.

e) Integration of Shape and Material

Not only is the pyramid's geometry crucial, but also its construction materials. The original limestone casing stones of the Great Pyramid, now mostly missing, had high insulating properties and smooth finishes, possibly contributing to the overall energy interaction mechanism. The internal chambers, composed of granite, may have served as nodes for energy concentration. Reference: Dunn, C. (1998). The Giza Power Plant. Bear & Company.

Chapter 3

III. The Influence of External Energy Fields on Intracellular Quantum Balance

a) The Physical Nature of Energy Fields

Any energetic field-whether electromagnetic, geometric, or gravitational-carries unique vibrational frequencies. These frequencies interact with the atomic and subatomic levels of matter, influencing how electrons, protons, and neutrons are spatially arranged. All matter is inherently vibrational, and its stability is derived from a continuous state of energy exchange. Thus, exposure to external fields may either enhance or disturb the energetic coherence of the system.

b) The Cell as a Quantum-Energetic Structure

Every atom within the cell carries either a positive or negative charge. The arrangement of these charges in highly ordered clusters determines the structural and functional stability of the cell. Cancer cells, for instance, are characterized by disturbed energetic distributions, reflecting chaotic internal quantum configurations. Re-establishing these balances could restore the original bioenergetic harmony necessary for healthy function.

c) Pyramid Shape as an Energetic Modulator

The pyramid, due to its precise geometric ratios and spatial symmetry, acts as a resonant structure. Research from institutions such as Yanshan University has demonstrated reduced oxidative stress, increased ATP production, and improved cell viability inside pyramidal chambers. These findings suggest that the pyramid functions not as a direct energy source, but as a field harmonizer-modulating existing electromagnetic and quantum fields within its space.

d) Quantum Reset Effect within the Cell

Rather than introducing new chemical changes, the pyramid field subtly alters the internal electrical balance of the cell. It may realign proton-electron distributions and recalibrate the energetic architecture of intracellular components.

This is analogous to restoring a corrupted digital signal back to its intended state-without rewriting the data, simply cleaning the signal.

e) Hypothesis Statement

By exposing cells-particularly energetically disrupted ones such as cancer cells-to geometrically optimized pyramid fields*, it is hypothesized that:*

- Reactive oxygen species (ROS) levels decrease,
- Electron and proton arrangements return to symmetry,
- Cellular signaling improves,
- And functionality returns to normal without the destructive side effects of chemotherapy or radiation.

This hypothesis warrants experimental validation but offers a promising avenue for non-invasive, frequency-based medicine.

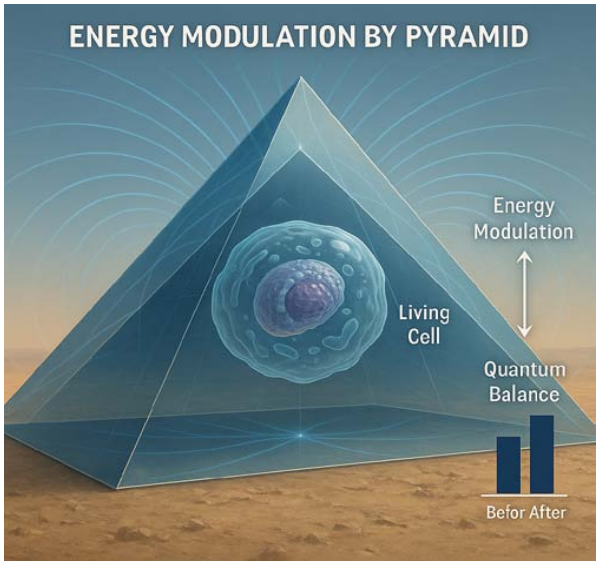

Figure 3

Chapter 4

IV. Experimental Evidence and Case Studies on Pyramid Influence

a) Scientific Studies on Pyramid Influence

While pyramid energy remains a topic of limited exploration within mainstream academia, a few empirical studies have emerged in recent years. One notable example is a study conducted by researchers at Yanshan University in China, where human 293T cells were placed inside a pyramid chamber. Results demonstrated increased ATP production, decreased reactive oxygen species (ROS), and improved mitochondrial membrane potential. These physiological shifts suggest a positive cellular adaptation potentially linked to an organized electromagnetic environment within the pyramid.

b) Independent and Anecdotal Experimental Reports

Beyond institutional research, independent researchers have conducted anecdotal experiments observing changes in water crystallization, seed germination, and decay rates of organic materials inside pyramid structures. Though not peer-reviewed, these experiments commonly report enhanced preservation, structural organization in water, and slower rates of spoilage- all attributed to the energy-modulating properties of the pyramid's geometric field.

c) Critical Evaluation of Methodologies

Most pyramid-related studies suffer from a lack of standardization, small sample sizes, or poorly controlled environments. Variables such as orientation, size, and materials used in pyramid construction vary widely, making it difficult to reproduce results across experiments. A consistent scientific framework is needed to evaluate the bioenergetic effects of pyramidal fields.

d) Proposed Experimental Model for Validation

To validate the proposed hypothesis, a controlled experimental model is necessary. *This includes:*

- A pyramid constructed to the proportions of the Great Pyramid of Giza.
- Shielded laboratory conditions to isolate electromagnetic interference.
- Measurement tools to evaluate ATP, ROS, calcium flux, and mitochondrial function.
- Replicable protocols to standardize timing, cell types, and exposure duration.

This proposed framework would allow for more definitive conclusions about the role of pyramidal geometry in restoring cellular energetic equilibrium.

e) Summary of Existing Insights

Although preliminary, existing case studies and experimental reports consistently point to a subtle yet measurable influence of pyramid structures on biological systems. With rigorous validation, this concept could open new frontiers in integrative energy-based medicine.

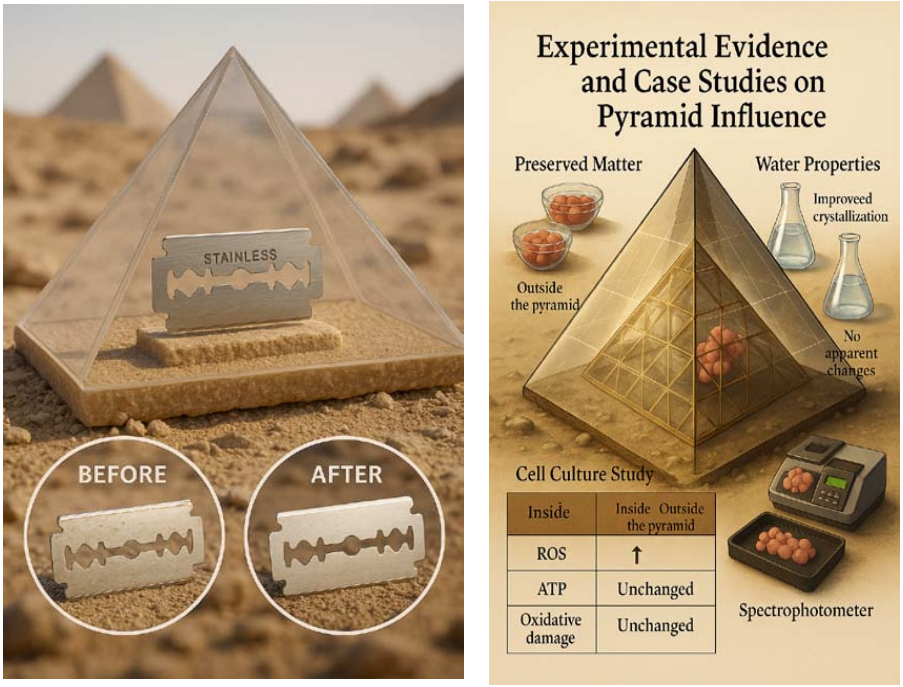

Figure 4

Chapter 5

V. Theoretical Modeling of Pyramid-Induced Cellular Realignment

a) Theoretical Framework of Interaction

The pyramid is proposed to act as a passive energetic modulator. Its geometric design may amplify and align existing environmental energy fields, including Earth's geomagnetic field. When a biological system, such as a cell, is placed within this field structure, subtle changes in atomic alignment and charge distribution may occur.

The principle lies in the hypothesis that geometrical symmetry fosters energetic symmetry at the molecular and atomic levels. This is particularly relevant in cancer cells, where quantum coherence is disrupted.

b) Electromagnetic and Resonance Equations

Theoretical modeling can draw on resonance principles.

- The Helmholtz equation ($\nabla^2\psi + k^2\psi = 0$) describes wave propagation within enclosed geometries.
- Pyramid structures may exhibit cavity resonance, influencing wave behavior within.
- These modulated waves may subtly affect the orientation and spin states of electrons in biological matter.
- While simplified here, such models could be refined using tools like COMSOL Multiphysics or electro-magnetic field solvers.

c) Energy Distribution within the Pyramid

Energy mapping simulations suggest that energy density is concentrated at one-third the height from the pyramid's base, often referred to as the 'King's Chamber' zone. This corresponds with observations in both physical and anecdotal experiments. Cells placed at this point may experience a reorganizing field that contributes to restoring quantum-level energetic balance.

d) Structural Influence on Cellular Biofields

Biological systems generate weak electro-magnetic fields, particularly across membranes. The hypothesis here is that when placed inside a resonating geometric structure like a pyramid, these fields become stabilized or enhanced. This stabilization may assist in correcting imbalances in cellular charge distributions-key markers of cancer cell dysfunction.

e) Applications in Medical Device Design

If pyramid-induced quantum realignment proves valid, this concept could inspire new designs for passive medical support systems.

- Pyramid-based healing chambers.
- Pyramidal shielding for immune-suppressed patients.
- Integrated energetic field modulators in treatment facilities.

Such applications could provide supportive, non-invasive options for managing chronic and energetic disorders.

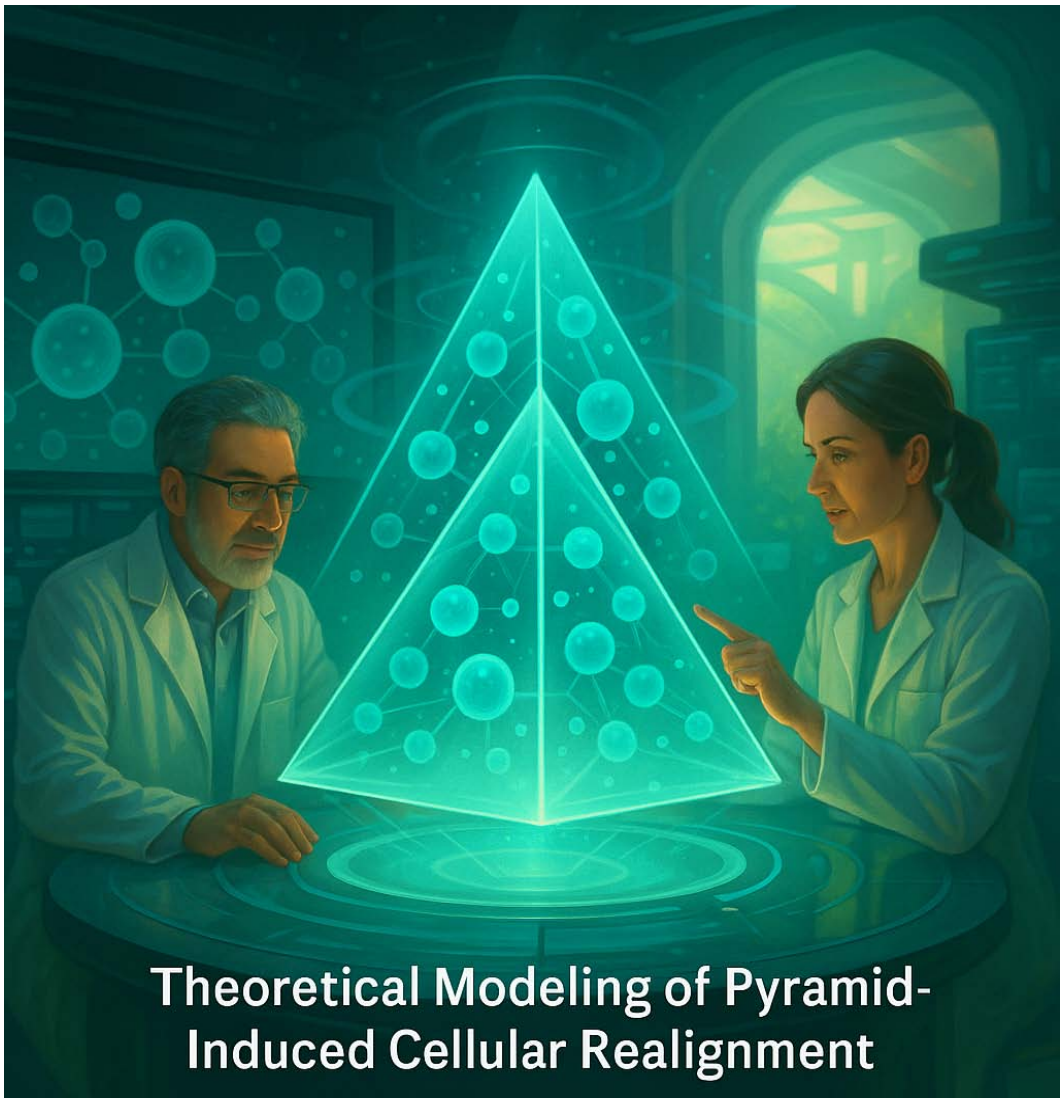

Figure 5

Chapter 6

VI. Applied Protocol for Cancer Treatment Using Pyramid Energy Therapy

a) Structural Design of Pyramid Therapy Room

Architectural Ratio: Maintains a height-to-base ratio of approximately 0.636 (e.g., height = 15 m, base = 23.6 m).

Materials: Uses semi-conductive non-metallic panels reinforced with quartz to enhance energy distribution.

EMF Shielding: Incorporates multi-layered Faraday shielding (e.g., Mu-Copper™) to block external electromagnetic interference.

True North Alignment: Uses GPS or astronomical corrections for accurate energetic alignment.

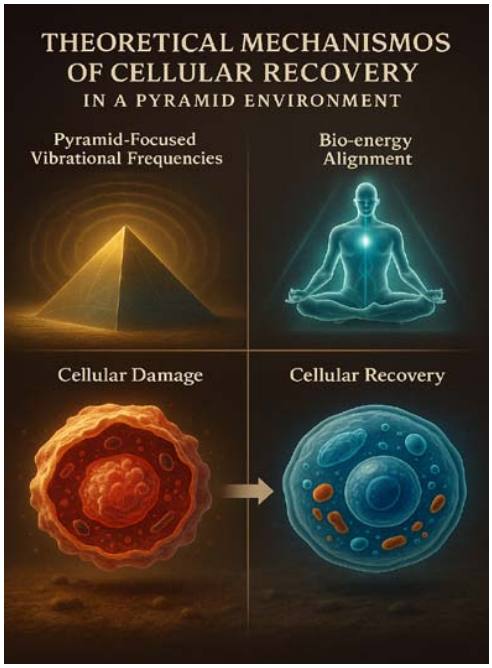

Figure 6

b) Ideal Environmental Conditions for the Patient

Temperature & Humidity: Maintains 21–23°C and 40-60% humidity to enhance immune recovery and prevent thermal stress.

Acoustic and Thermal Isolation: Ensures ambient noise <40 dB and optimal thermal insulation for patient comfort.

Lighting: Full-spectrum LED lighting simulating natural daylight with tunable controls for biological resonance.

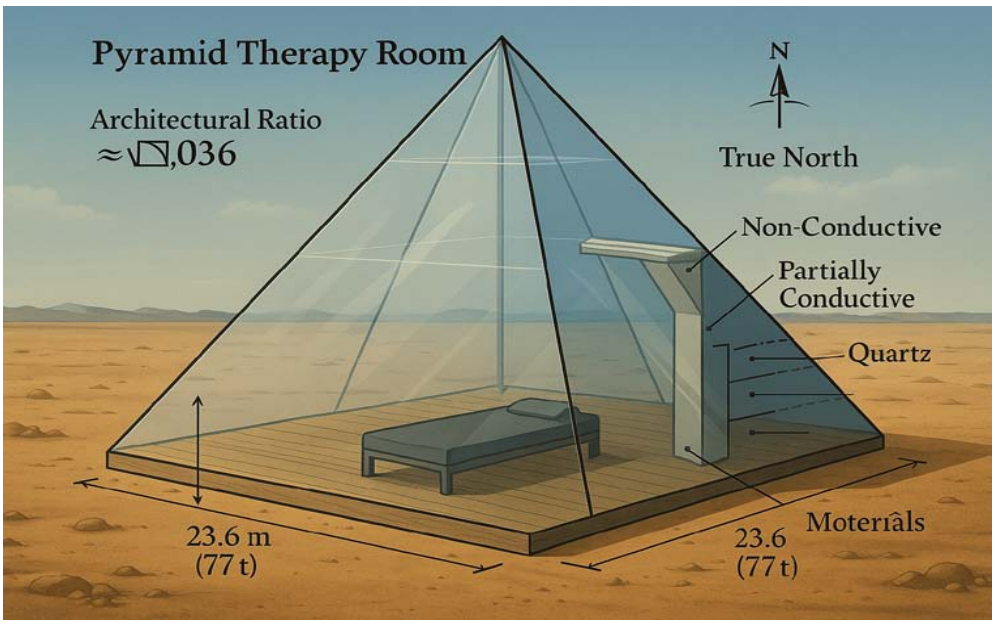

Figure 7

c) Patient Comfort during Sessions

Energy Focus Point: Beds positioned along the pyramid's central resonance axis.

Session Duration: 30–60 minutes per session, depending on individual response.

Mood Enhancement: Incorporates binaural beats (e.g., 10 Hz to reduce anxiety, 528 Hz to stimulate cell energy).

Aromatherapy: Leverages olfactory stimuli known to improve patient relaxation.

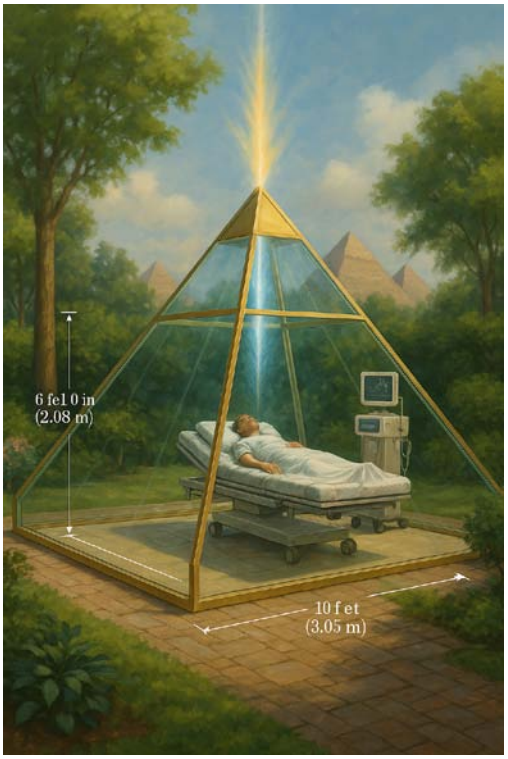

Figure 8

d) Measuring the Therapeutic Impact

Reactive Oxygen Species (ROS): Measured with Cell ROX & MitoSOX fluorescent dyes.

ATP Production: Assessed using NMR-based or FRET-FACS techniques.

Membrane Potential: Tracked with ANNINE-6plus or ANEP voltage-sensitive dyes.

Bioelectric Imaging: Utilizes confocal or voltage-mapping technologies.

e) Therapeutic Schedule and Monitoring Plan

Therapy Frequency: 2–3 sessions per week over 4–6 weeks.

Biomarker Monitoring: ROS, ATP, $\Delta\psi m$, CA-19-9, and LDH levels.

Quality of Life Surveys: Based on international palliative care guidelines.

Integrated Approach: Used in conjunction with standard chemotherapy/radiation.

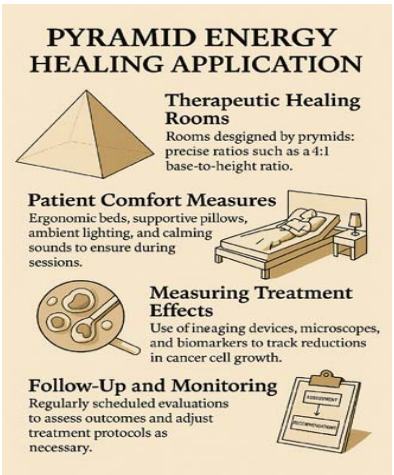

Figure 9

Chapter 7

VII. Future Potentials and Scientific Challenges of Pyramid Energy Cancer Therapy

a) *Strengths of the Pyramid Healing Model*

- *Non-Invasive:* Does not involve pharmaceutical compounds or surgical intervention.
- *No side Effects:* Unlike chemotherapy or radiation, there are no cytotoxic effects.
- *Energy-Centered:* Targets the atomic and energetic integrity of cells, potentially restoring natural balance.
- *Design-based Therapy:* Leverages geometric resonance rather than mechanical intervention.

b) *Current Scientific Challenges and Limitations*

- Lack of large-scale clinical trials published in peer-reviewed journals.
- Difficulty in directly measuring quantum energetic balance within live tissue.
- Absence of unified theoretical frameworks connecting shape geometry to cellular healing.
- Institutional resistance from mainstream medical systems to unconventional methods.

c) *Future Development Opportunities*

- Integration with existing therapies to enhance recovery and immune response.
- Modular pyramid therapy rooms for hospitals, hospices, and remote care centers.
- Development of measurable bio-indicators that correlate with energy modulation.
- Incorporation of AI to model and predict energetic shifts inside pyramid structures.

d) *Role of Technology in Advancement*

- Quantum imaging and energy field mapping to visualize shifts in cellular potential.
- Real-time monitoring using biosensors and low-intensity electromagnetic feedback.
- Computational simulation of electromagnetic harmonics within pyramid designs.
- Machine learning models to evaluate patient-specific energy response patterns.

e) *Ethical and Scientific Considerations*

- Use as complementary care, not as a replacement for established medical treatments.
- Informed consent and full disclosure of expected outcomes.
- Regulation and accreditation of pyramid healing centers and practices.
- Scientific neutrality in publishing results, avoiding exaggeration or pseudoscientific claims.

Figure 10

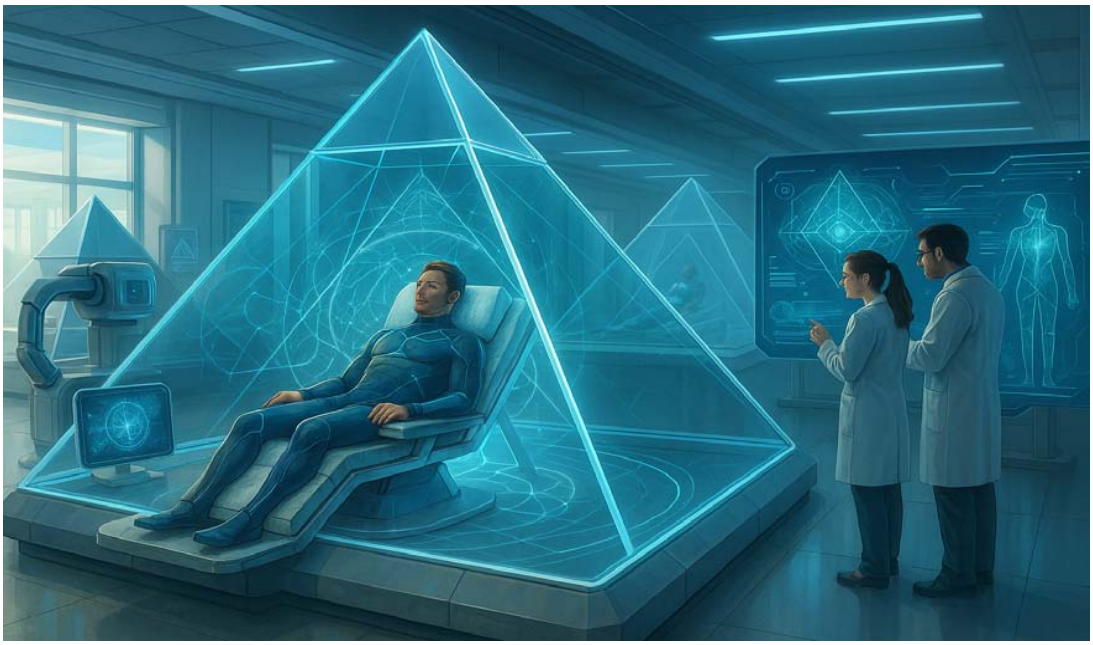

Figure 11

Chapter 8

VIII. Comparative Analysis – Pyramid Energy Therapy vs. Conventional Cancer Treatments

a) Pyramid Energy Therapy Overview

Pyramid energy therapy is rooted in the idea that geometric structures influence energetic fields, restoring quantum-level balance in biological systems. This method is non-invasive and works passively by modulating the energetic environment of the body. Its potential lies in harmonizing disrupted biofields without harming healthy tissues. However, its clinical validation remains limited and under investigation.

b) Chemotherapy and Radiation Overview

Chemotherapy and radiation remain the backbone of conventional cancer care. These therapies directly attack rapidly dividing cells, including cancerous ones, but often affect healthy tissues in the process. Side effects include immune suppression, nausea, fatigue, and hair loss. Their effectiveness is well-documented, but their toxicity and systemic impact are significant concerns.

c) Immunotherapy and Targeted Molecular Therapy

Modern treatments like immunotherapy and targeted molecular drugs aim to increase specificity. By identifying molecular targets or enhancing immune responses, these methods offer higher precision with reduced collateral damage. However, they require complex diagnostics and can be prohibitively expensive for many patients.

d) Comparative Table

Table 1

Criteria	Pyramid Therapy	Chemotherapy	Radiation	Immunotherapy	Targeted Therapy
Mechanism	Energetic balance	Chemical destruction	Ionizing waves	Immune activation	Molecular inhibition
Side Effects	Minimal to none	Severe	Severe	Mild–moderate	Mild–moderate
Scientific Support	Limited emerging	Extensive clinical data	Extensive	Growing evidence	Established for some cancers
Accessibility	Low-cost, easy setup	Hospital-based	Hospital-based	Requires specialists	Expensive diagnostics
Integration Potential	High (complementary)	Primary treatment	Primary treatment	Adjunct/primary	Adjunct/primary
Patient Impact	Holistic restoration	Systemic burden	Systemic damage	Immunomodulation	Gene/protein targeting

e) Integrative Outlook

The pyramid therapy model, while unconventional, holds promise as a non-invasive complementary modality. Its use alongside chemotherapy or immunotherapy may enhance patient comfort, reduce anxiety, and potentially support energetic restoration post-treatment. The future of oncology may lie in integrating biophysical, biochemical, and quantum approaches for a more holistic treatment model.

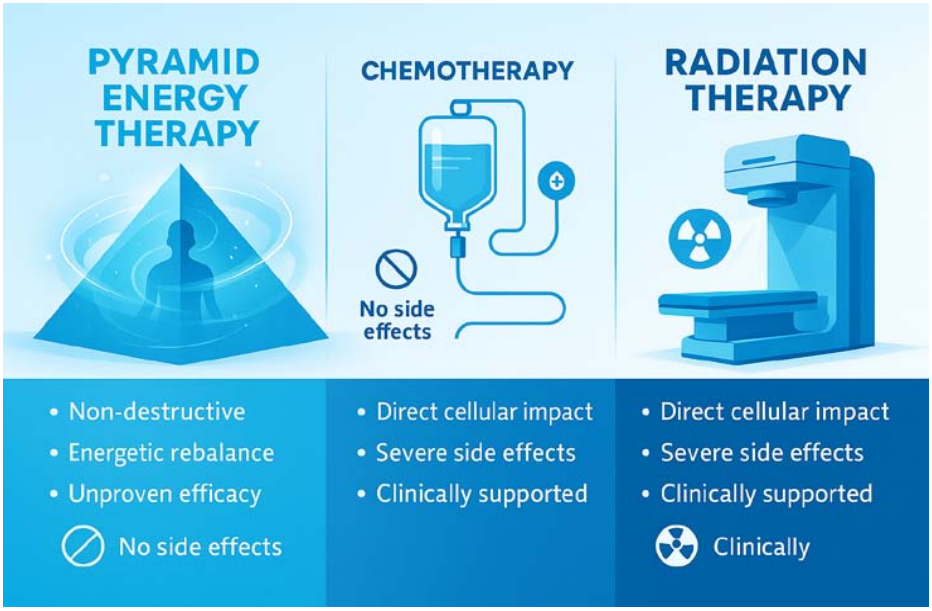

Figure 12

Chapter 9

IX. Towards a New Paradigm in Oncology – Energy-based Therapies and the Pyramid Model

a) Synthesis of Core Findings

This research journey has explored the possibility that all matter-including living cells-is fundamentally energetic in nature. By tracing biological matter to its atomic components and further into subatomic energy fields, we uncover a model where cellular health is tied to energetic equilibrium. Pyramid geometry, with its unique spatial resonance, presents a promising tool to restore this balance, potentially supporting cancer therapy without invasive damage.

b) Future Vision – Design as Therapy

In traditional oncology, treatment focuses on biochemical intervention. However, this research proposes a shift towards 'therapeutic design'-where the geometry of space plays a vital role in restoring health. The pyramid structure may function as a bioenergetic tuning device, promoting quantum-level balance in diseased cells. Such a vision opens the door for non-destructive reprogramming of cellular behavior.

c) Research Roadmap

To transition from hypothesis to clinical utility, a set of standardized experimental protocols is needed. These should include controlled lab studies, cellular biofield measurements, and long-term therapeutic outcomes. Collaboration between physicists, biomedical engineers, oncologists, and quantum researchers is essential to advance this integrative paradigm.

d) Ethical and Clinical Integration

While pyramid energy therapy shows potential, ethical prudence is critical. It must not replace evidence-based treatments prematurely, nor be exploited commercially without validation. Instead, it should be integrated cautiously into holistic care models, under strict ethical oversight and informed consent. Institutional review boards (IRBs) must oversee pilot studies and ensure patient safety.

Chapter 10

X. Experimental Design and Hypothesis Testing for Pyramid Energy Therapy

a) Introduction

To validate the scientific credibility of Pyramid Energy Therapy (PET), it is essential to develop a rigorous experimental design. This chapter outlines a structured approach to designing experiments that test the core hypotheses of PET, including its influence on cellular behavior, physiological states, and energetic equilibrium within biological systems.

Figure 13

b) *Defining the Hypotheses*

Primary Hypothesis (H1): Exposure to a structured pyramid energy field induces measurable changes in the vitality and function of human cells.

Secondary Hypothesis (H2): PET contributes to the restoration of quantum energetic equilibrium in diseased cells, particularly cancerous cells.

Null Hypothesis (H0): There is no significant effect of pyramid exposure on biological systems beyond placebo or environmental factors.

c) *Experimental Models*

In Vitro Studies:

- Use of cultured cancer cell lines (e.g., HeLa, MCF-7, A549).
- Exposure periods ranging from 30 minutes to 24 hours.
- Control group in standard lab conditions; experimental group placed under pyramid chamber.
- Evaluation parameters: apoptosis markers, cell viability assays, mitochondrial function.

In Vivo Models:

- Animal models (e.g., mice with induced tumors).
- Pyramidal healing chambers integrated within animal housing.
- *Monitoring:* Tumor growth, cytokine levels, behavior, survival rate.

Human Trials (Long-Term Goal):

- Small-scale observational pilot studies.
- Patient groups with complementary therapies using pyramid exposure.
- Ethical considerations, informed consent, psychological monitoring.

d) *Experimental Chamber Design*

- Construction of laboratory-scale pyramids from non-metallic, non-magnetic materials.
- Geometrical fidelity to the Great Pyramid of Giza.
- Interior equipped with sensors to measure electromagnetic flux, air ionization, and Schumann resonance frequency shifts.

e) *Data Collection and Analysis*

- Use of real-time imaging and biosensors for physiological measurements.
- *Quantitative Techniques:* RT-PCR, flow cytometry, spectroscopy.
- *Statistical Tools:* ANOVA, multivariate analysis, regression modeling.
- Data reproducibility protocols and blind study design to eliminate bias.

f) *Collaboration and Ethics*

- Institutional partnerships with biomedical labs and physics departments.
- Ethical review board approval for animal and human studies.
- Data transparency and publication in peer-reviewed journals.

Conclusion

Designing a robust and ethically sound experimental protocol is fundamental to transitioning Pyramid Energy Therapy from a theoretical framework to a scientifically validated treatment model. The experimental structure described herein serves as the foundation for this transformation.

Figures, diagrams, and charts detailing the setup of pyramid chambers, sensor placement, and energy field distribution will be included in the final version.

Chapter 11

XI. Ethical Considerations and Scientific Integrity in Pyramid Energy Therapy

a) *Introduction*

As pyramid energy therapy (PET) garners increasing attention as a potential complementary approach to cancer treatment, it becomes essential to address the ethical dimensions of its development, testing, and application. Given the vulnerable state of patients with cancer and the experimental nature of pyramid-based energy therapies, rigorous ethical standards must be upheld to ensure patient safety, dignity, and trust.

Figure 14

b) *Respect for Human Dignity*

Respecting human dignity is foundational in any therapeutic context. In PET, patients must not be treated as mere subjects or data points. Instead, they should be considered autonomous individuals with intrinsic value, deserving of empathy, transparency, and informed involvement in their treatment.

- Patient-centered approach: Practitioners must ensure that each individual's cultural, psychological, and spiritual needs are acknowledged.
- Avoiding objectification: Patients participating in experimental therapies must be shielded from any form of exploitation or reductionism.

c) *Scientific Rigor and Transparency*

To maintain legitimacy and foster trust in PET, researchers and practitioners must adhere to scientific principles:

- Evidence-based design: Therapies should be developed based on a solid foundation of empirical research, including peer-reviewed studies, reproducible experiments, and standardized methodologies.
- Transparent reporting: Results of clinical trials, whether favorable or not, must be made publicly accessible. Selective publication undermines scientific integrity.
- Peer review and replication: Theories and therapeutic claims should be evaluated by independent experts and subjected to replication before being accepted or promoted.

d) *Informed Consent and Patient Autonomy*

Patients must have the autonomy to choose or reject PET without coercion or misinformation.

- *Comprehensive information:* Before participation, patients must receive clear and understandable explanations of the therapy, including its experimental nature, potential benefits, and risks.
- *Voluntary participation:* Consent must be obtained freely, without undue pressure or manipulation, particularly from those in positions of authority or trust.
- *Right to withdraw:* Participants should retain the right to exit the therapy at any stage without facing repercussions.

e) *Ethical Challenges in Alternative Therapies*

PET exists within the broader category of alternative and complementary medicine, which poses unique ethical dilemmas:

- *False Hope Vs. Healing Potential:* It is unethical to promise or imply guaranteed cures. Any therapeutic claims must be presented with scientific caution and humility.
- *Misinformation and Pseudoscience:* Practitioners must distance themselves from unfounded claims or practices that could harm patients or erode credibility.
- *Regulatory Oversight:* There must be collaboration with health authorities and ethical review boards to ensure adherence to safety standards and scientific protocols.

f) *Safeguards against Exploitation*

Given the often desperate situations of patients with advanced illnesses, ethical safeguards are critical:

- *Affordable Access:* PET should not become a privilege only for the wealthy. If still under investigation, participation should be free or minimally charged.
- *Monitoring and Accountability:* Independent committees must oversee the implementation of PET, ensuring ethical conduct and immediate response to adverse events.
- *Education and Training:* Practitioners must undergo proper training in ethical standards, patient communication, and responsible research practices.

g) *Conclusion*

Ethical considerations and scientific integrity are not peripheral to the development of pyramid energy therapy-they are central. As this modality evolves, its credibility and potential depend heavily on transparent science, patient-centered care, and unwavering adherence to ethical principles. By embedding these values at every stage, PET can be explored responsibly as a possible tool in the broader landscape of cancer therapy.

Chapter 12

XII. Challenges and Limitations in the Implementation of Pyramid Energy Therapy

a) *Introduction to the Scope of Challenges*

As the concept of Pyramid Energy Therapy (PET) gains attention in the field of alternative medicine,

numerous challenges emerge that hinder its mainstream acceptance and application. These obstacles span across scientific, technical, cultural, and ethical domains, necessitating a holistic understanding of the barriers in order to facilitate responsible and evidence-based integration.

Figure 15

b) Scientific Skepticism and Lack of Consensus

One of the most prominent barriers is the lack of empirical consensus regarding the efficacy of PET. Mainstream science often views pyramid energy as pseudoscientific due to insufficient peer-reviewed data. The absence of repeatable, controlled experiments and a unified theory explaining how pyramid structures influence biological systems fuels skepticism among researchers and clinicians.

c) Technical Limitations in Pyramid Construction and Standardization

Constructing therapeutic pyramids with precise geometrical proportions, material consistency, and orientation to true north poses a significant challenge. Variability in construction methods can lead to inconsistent energy distribution, undermining the reproducibility and effectiveness of the therapy. Standardizing pyramid dimensions and materials is crucial for clinical validation.

d) Measurement and Quantification Difficulties

Measuring the bioenergetic fields or energetic resonance purportedly emitted by pyramid structures remains difficult with current scientific instruments. Without objective tools to quantify these energy interactions, PET lacks a measurable basis that would allow for systematic study, optimization, and clinical application.

e) Integration with Conventional Cancer Therapies

PET's integration with existing oncology protocols presents additional obstacles. Medical professionals often hesitate to combine conventional therapies with unverified alternatives due to concerns about interference, patient safety, and legal liability. Establishing a clear framework for complementary use, supported by clinical studies, is essential.

f) Cultural and Institutional Resistance

Despite rising interest in holistic and energy-based healing modalities, many institutions and cultures remain resistant to unconventional approaches. Medical curricula rarely include education on energy therapies, and regulatory bodies may not have frameworks to evaluate or approve such modalities. This institutional inertia slows research funding, clinical trials, and public acceptance.

g) Ethical and Legal Barriers

Ethical concerns regarding the exploitation of vulnerable patients, misrepresentation of scientific data, and lack of regulatory oversight pose serious challenges. Without clearly defined legal and ethical boundaries, PET could face backlash from both the public and medical communities. Developing professional guidelines and patient protections is necessary for legitimacy.

h) Conclusion: Overcoming the Barriers

While the challenges facing Pyramid Energy Therapy are substantial, they are not insurmountable. A multidisciplinary effort involving open-minded researchers, ethical practitioners, and patient advocacy groups is essential. By addressing the scientific, technical, cultural, and legal limitations, PET can be responsibly developed and potentially recognized as a viable complementary therapy in the battle against cancer.

Chapter 13

XIII. Future Research Directions and Innovation In Pyramid Energy Therapy

a) Introduction: The Need for Rigorous Scientific Exploration

As Pyramid Energy Therapy (PET) enters the scientific spotlight, there is a compelling need to establish structured, evidence-based research methodologies. Future progress depends on robust interdisciplinary collaborations that integrate physics, medicine, biology, and technology to uncover the mechanisms and applications of pyramid-based healing.

Figure 16

b) *Proposed Experimental Frameworks and Clinical Trials*

Establishing controlled, double-blind clinical studies is critical to assess the therapeutic impact of PET. Researchers should define clear metrics-such as tumor regression rates, patient-reported outcomes, and physiological markers-to validate effectiveness. Animal studies and in vitro cellular models can help uncover mechanisms before moving to human trials.

c) *Development of Precision Pyramid Technology*

Future innovation in PET will likely revolve around the design and fabrication of pyramids using nanomaterials, electromagnetic-sensitive substrates, and programmable configurations. 3D printing and smart materials may enable adaptive pyramids that self-calibrate according to patient-specific energetic needs.

d) *Biofield Mapping and Advanced Imaging Techniques*

New imaging modalities such as magnetic field tomography, thermographic sensors, and quantum resonance analysis could help visualize biofield fluctuations under PET. Mapping changes in cellular energy profiles during and after therapy sessions will provide insights into energetic interactions and healing responses.

e) *Synergistic Therapies: Combining Pyramid Energy with Other Modalities*

PET's efficacy may be enhanced when integrated with other non-invasive therapies such as sound healing, infrared therapy, and pulsed electromagnetic fields (PEMF). Exploring the synergistic effects of such combinations can open avenues for holistic, multimodal cancer treatment strategies.

f) *Artificial Intelligence in Pyramid Energy Optimization*

Artificial Intelligence (AI) and machine learning algorithms can analyze large datasets from PET sessions to optimize pyramid design, session duration, orientation, and environmental parameters. Predictive models may help tailor therapy plans to individual energetic signatures, improving outcomes and consistency.

g) *Institutional Collaborations and Funding Pathways*

Advancing PET research requires cross-institutional support, including academic partnerships, government grants, and private sector investment. Establishing dedicated research centers and publishing in reputable journals will increase visibility and credibility.

h) *Conclusion: A Roadmap for Transformative Discovery*

The future of Pyramid Energy Therapy holds significant promise if pursued with scientific integrity, technological innovation, and collaborative spirit. By laying down rigorous research pathways today, the next generation of scientists and clinicians can unlock the full therapeutic potential of pyramid energy in combating cancer and enhancing human health.

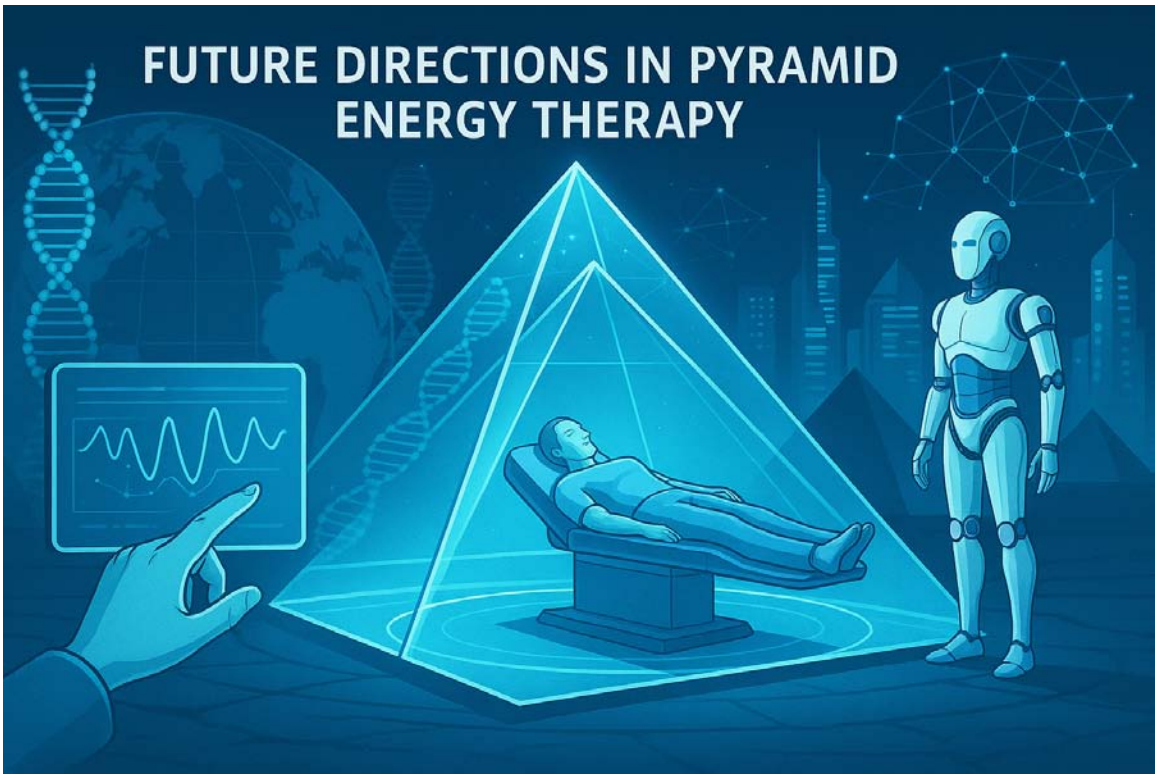

Figure 17

Chapter 14

XIV. Final Summary and Strategic Recommendations

1. Comprehensive Summary of Findings
   - This research has demonstrated the potential therapeutic role of pyramid-shaped structures in modulating energetic balances at the quantum level within biological tissues.
   - The pyramid energy framework provides a non-invasive, non-toxic complementary approach to addressing cellular energy imbalances, particularly in malignant cells.
2. Strategic Vision for Implementation
   - Establish standardized pyramid therapeutic chambers based on precise geometric specifications and electromagnetic alignment.
   - Develop protocols for patient positioning, exposure duration, and environmental control to maximize efficacy.
3. Policy and Clinical Integration
   - Advocate for the inclusion of pyramid energy modalities within integrative oncology frameworks, in alignment with guidelines by NCCIH, NCI, and ASCO.
   - Encourage clinical trials and observational studies to evaluate safety, efficacy, and quality-of-life outcomes.
4. Scientific Collaboration and Technological Advancements
   - Launch international collaborations to standardize research methodologies and share empirical data.
   - Develop advanced biophysical instrumentation for detecting and measuring bioenergetic field changes in response to pyramid therapy.
5. Concluding Message
   - A call to action for researchers, clinicians, and policymakers to explore ancient wisdom through
   - the lens of modern science.
   - Propose the foundation of an interdisciplinary Global Pyramid Research Institute to unify efforts and validate applications of pyramid energy in medical science.

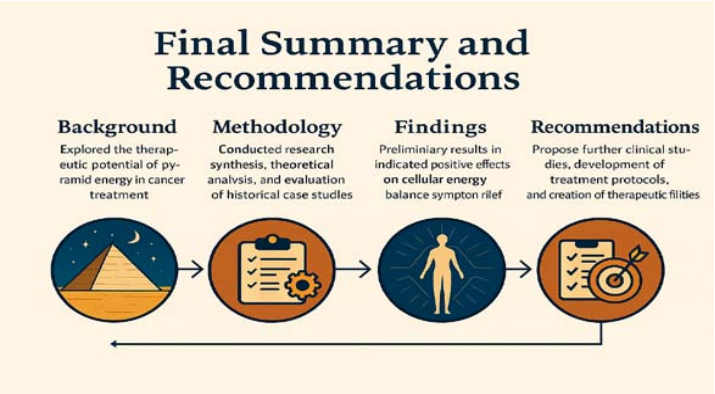

Figure 18

Chapter 15

xv. Feasibility Assessment and Future Challenges

a) Introduction

In the pursuit of integrating Pyramid Energy Therapy (PET) into an approved clinical framework, a comprehensive feasibility assessment becomes essential. This includes anticipating the potential challenges that may hinder the realization of this objective.

b) Scientific Feasibility Assessment

The formal adoption of pyramid energy as a recognized therapeutic path requires solid scientific support through laboratory and clinical experiments. The scientific feasibility rests upon the following pillars:

- A theoretical foundation rooted in atomic structure and the energetic nature of the cell.
- The ability to measure changes in the energetic balance of affected cells.
- Preliminary evidence suggesting that the pyramid field exerts measurable physical effects on biological structures.

c) Technical Challenges

- The difficulty in designing highly sensitive instruments capable of detecting minute energetic fluctuations within the cell.

d) Scientific and Academic Challenges

- Limited number of peer-reviewed studies published about pyramid energy.
- Conservative attitudes in traditional academic circles toward unconventional energy therapies.
- The necessity for collaboration with international universities and research centers to conduct randomized controlled trials (RCTs).

e) Ethical and Regulatory Challenges

- The need for a clear legal framework to govern the practice of this type of therapy and protect
- The requirement to subject pyramid chambers and treatment methodologies to reliable testing for safety assurance.
- Oversight by scientific research ethics committees to monitor the development of studies and document their results.

f) Opportunities for Funding and Institutional Support

- The possibility of obtaining support from innovation research centers and universities interested in complementary therapies.
- Collaboration with nonprofit medical organizations to fund pilot studies.
- The potential to patent the therapeutic pyramid chamber design and use it as a future funding source.

g) Conclusion

Feasibility assessment is inseparable from recognizing the challenges and addressing them through disciplined scientific methods. With a proactive approach, pyramid energy therapy may one day become an officially recognized option within the field of integrative medicine.

Chapter 16

xvi. Global Practices of Pyramid-Shaped Healing and Structural Bio-Energy

a) Introduction

While Pyramid Energy Therapy (PET) continues to mature within laboratory and pilot-clinical settings, a number of wellness centres and research initiatives around the world have already integrated pyramid-shaped structures into daily therapeutic routines. This chapter surveys those contemporary applications, evaluating their operational models, claimed benefits, and the current evidence base supporting their practices.

b) *Indonesia: The Pyramids of Chi, Ubud – An Acoustic Bio-Resonance Model*

Located in the rainforest terraces of Ubud, Bali, the Pyramids of Chi consists of two 14-m-tall canvas-on-steel pyramids precisely aligned to magnetic north. Daily 'Ancient Sound Healing' sessions employ gongs, didgeridoos, and Himalayan singing bowls to generate low-frequency acoustic fields that reverberate within the pyramid cavity. Clients report deep relaxation, improved sleep quality, and reductions in perceived stress. The centre's popularity demonstrates a viable tourism-health hybrid model that finances continued experimentation with acoustic bio-resonance inside pyramidal volumes.

Figure 19

c) *United States: Pyramid Village, Florida – Residential Wellness Infrastructure*

Pyramid Village in Fort Myers comprises 26 glass-and-aluminium chalets arranged around a geothermal lake. Conceived by Austrian engineers in the late 1990s, the resort markets the pyramid as a form that 'optimises subtle energies' for detoxification and musculoskeletal recovery. On-site programmes combine hydrotherapy, yoga, and light-therapy sessions within the chalets, attracting long-stay guests seeking integrative convalescence.

Figure 20

d) Russian Federation: The Golod Pyramids – Large-Scale Public Experiments

Engineer Aleksandr Golod constructed more than a dozen fibreglass pyramids up to 44 m high across Russia and Ukraine. Non-peer-reviewed field studies attributed to Golod claim enhanced immune response in volunteers, faster seed germination, and suppression of pathogenic bacteria-effects hypothesised to arise from spatial charge separation within the pyramid geometry. Although methodological transparency is limited, the scale of the installations offers a living laboratory for future controlled trials.

Figure 21

e) Bosnia & Herzegovina: The Visoko 'Pyramids of the Sun' Complex – Geobiological Claims

Guided tours through the Ravne underground tunnels near Visoko expose visitors to a reportedly high concentration of negative ions and low electromagnetic noise. Preliminary physiological monitoring suggests transient drops in heart-rate variability indices associated with stress. The site illustrates how heritage tourism can intersect with experimental geobiological wellness practices, though rigorous clinical data remain sparse.

Figure 22

f) Emerging Clinical and Architectural Research

Small animal studies indicate that housing under pyramid structures can mitigate neuroendocrine and oxidative stress markers, lending pre-clinical support for pyramid-mediated homeostasis. Parallel architectural proposals envision hospital wards built as nested pyramid shells to exploit natural ventilation, daylight, and alleged shape-induced bio-energetic benefits. Pilot projects are under development in India and Egypt.

Figure 23

g) Comparative Analysis and Lessons for PET Development

Across these diverse contexts, common operational themes emerge: (i) precise geometric construction aligned to true north, (ii) integration of complementary modalities (sound, light, hydro- or yoga-therapy), and (iii) a strong experiential narrative emphasising subtle-energy optimisation. For researchers, these implementations offer real-world testbeds to evaluate user safety, dosing parameters (duration, frequency), and scalable business models that could support future randomised, controlled investigations.

Figure 24

h) Conclusion

The existence of functioning pyramid-based wellness centres across four continents provides pragmatic evidence that PET concepts are already influencing health-seeking behaviour. Although scientific validation is incomplete, the operational data, client testimonies, and emerging bio-marker studies collectively justify expanded research into structural bio-energy. Systematic documentation of these global practices will strengthen the translational pipeline from experimental physics to integrative oncology.

Chapter 17

XVII. Ethical Considerations and Scientific Integrity

a) Introduction

As pyramid energy therapy advances toward clinical investigation and possible integration into healthcare systems, it is imperative to uphold the highest standards of ethics and scientific integrity. This chapter explores the moral obligations, research responsibilities, and regulatory expectations associated with studying and applying an alternative energy-based treatment for cancer.

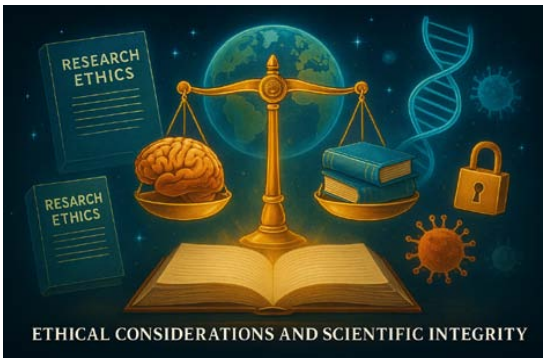

Figure 25

1. Informed Consent and Patient Autonomy
Patients have the right to understand the nature, purpose, and potential outcomes of any experimental therapy:
   - Full disclosure of pyramid therapy's experimental status.
   - Avoiding exaggerated claims or implied guarantees.
   - Ensuring patient decisions are voluntary, without coercion.
2. Avoiding False Hope and Medical Misrepresentation
Alternative therapies often attract patients with advanced disease or limited options. It is ethically vital to:
   - Present pyramid therapy as complementary, not curative or primary treatment.
   - Clearly state the current lack of large-scale clinical validation.
   - Encourage parallel use with evidence-based medicine.
3. Scientific Rigor in Research

Maintaining research integrity is essential to earn respect within the scientific and medical communities:
   - Apply standardized methodologies, including control groups and blinding when possible.
   - Publish results transparently, whether positive or negative.
   - Engage third-party validation and peer review.
4. Regulatory and Institutional Oversight
All clinical studies must comply with international and national regulations:
   - Secure approval from ethics committees and institutional review boards (IRBs).
   - Follow the Helsinki Declaration and Good Clinical Practice (GCP) guidelines.
   - Protect patient data privacy and adhere to biosafety standards.
5. Cultural Sensitivity and Respect
   - Energy-based therapies may be rooted in spiritual or traditional beliefs.
   - Respect cultural interpretations without misappropriating indigenous knowledge.
   - Avoid framing pyramid energy therapy in purely mystical or religious terms in scientific contexts.
6. Balancing Innovation with Responsibility
Scientific innovation should not override moral responsibility.
   - Carefully weigh potential benefits against unknown risks.
   - Ensure that exploratory studies are preceded by robust in-vitro and animal testing when applicable.
7. *Conclusion*

Ethical clarity is the foundation upon which pyramid energy therapy must be built if it is to gain legitimacy in the medical field. By fostering transparency, patient protection, rigorous research, and cultural sensitivity, this alternative modality can be responsibly explored as part of the broader search for holistic approaches to cancer treatment.

Chapter 18

XVIII. Experimental Design: using an egg as a Model for Cellular Response to Pyramid Energy

a) Introduction

This experiment aims to investigate the potential effects of pyramid-shaped structures on biological matter by using a chicken egg as a model for a living cell. The hypothesis is based on the concept that biological cells, composed of subatomic energy fields, may respond to the unique energy distribution within a pyramid.

b) Objective

To observe and analyze potential structural or energetic changes in a chicken egg after exposure to a pyramid-shaped healing chamber for a specified duration.

c) Materials and Equipment

- 1 raw chicken egg (uncooked, room temperature).
- Transparent pyramid model with exact geometric proportions (e.g., replica of the Great Pyramid).
- Timer or stopwatch.
- Thermometer (optional, to monitor environmental variables).
- Notebook or digital device for documenting observations.
- Camera for visual documentation.

d) Procedure

1. Place the raw chicken egg gently on a non-conductive support inside the pyramid, aligning it with the vertical axis.
2. Ensure that the environment is stable, with minimal external interference.
3. Leave the egg inside the pyramid for a defined duration (e.g., 24, 48, and 72 hours).
4. Take periodic photos and notes on visual appearance, consistency, smell, or any observable changes.
5. After exposure, compare the egg with a control egg (not placed in the pyramid) under the same environmental conditions.

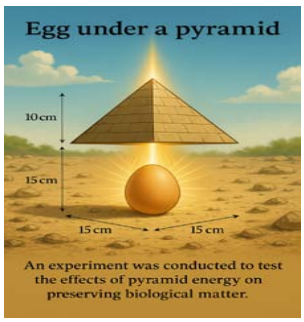

Figure 26

e) Data Collection and Observation

Carefully document any changes observed in the egg. Look for signs of dehydration, yolk stabilization, protein coagulation, or absence of odor typically associated with decay. Compare control vs experimental results.

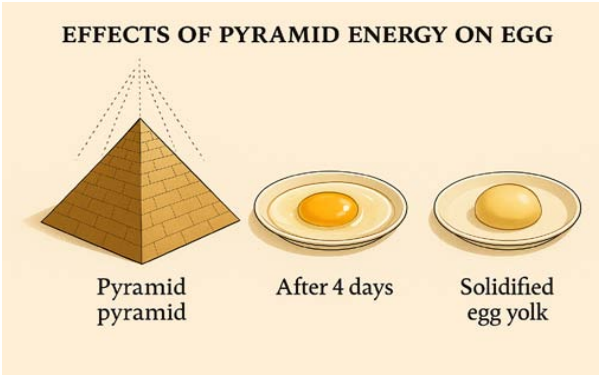

Figure 27

f) Expected Results

It is hypothesized that the pyramid's geometric energy field may help preserve the egg or trigger changes indicating subtle energetic effects, such as altered viscosity or improved structural integrity, consistent with previous pyramid energy studies.

g) Scientific Relevance

This experiment serves as a preliminary step to assess biological energy interaction with geometric fields. If results are promising, they could justify more advanced studies on energy-based cancer therapy models using actual cellular systems.

Figure 28

Chapter 19

XIX. Final Vision and Philosophical Reflections

a) Introduction

This final chapter offers a contemplative synthesis of the ideas, efforts, and aspirations woven

throughout this research. More than just a scientific hypothesis, pyramid energy therapy invites us to revisit ancient wisdom through the lens of modern science, urging humanity to rediscover balance, energy, and healing beyond conventional paradigms.

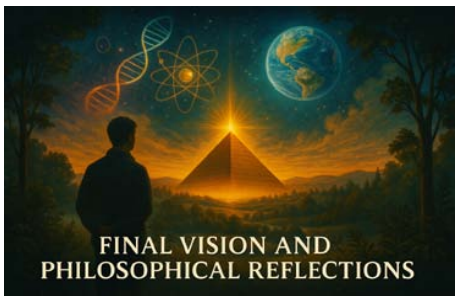

Figure 29

1. Revisiting the Journey From its theoretical foundation in quantum and energetic models of the cell, to the experimental frameworks and ethical considerations, this research has charted a visionary pathway. It proposes that life is not solely biochemical, but profoundly energetic. The pyramid-once a monument-is now a candidate for medical innovation.
2. The Pyramid as Symbol and Instrument The geometric perfection of the pyramid is more than architecture-it may embody harmonic resonance with Earth's magnetic field, cosmic alignment, and cellular organization. When repurposed as a healing structure, it becomes:
   - A sanctuary of energetic coherence
   - A space where form influences function
   - A bridge between ancient spiritual architecture and modern therapeutic environments
3. Philosophical Resonance

Pyramid energy therapy challenges us to expand our definition of healing. It suggests that:

- Healing is not just the removal of disease, but restoration of harmony.
- Energy fields may be as vital as chemistry.
- The human body responds not only to substances, but to form, frequency, and light.

4. Humanistic and Ethical Vision

This research upholds that every patient deserves dignity, choice, and hope. If pyramid energy can offer a gentle, supportive adjunct to healing, it must be explored with compassion, not skepticism; with open inquiry, not dismissal.

5. A Call to Science and Spirit

We invite scientists, physicians, engineers, and healers to collaborate. To unite empirical tools with intuitive insights. To embrace an inclusive paradigm where innovation meets humility.

Let the pyramid stand not only as a relic of the past-but as a beacon of a future where healing is multi-dimensional.

Closing Words

1. This work is not a conclusion-it is an invitation. An invitation to study, to challenge, to dream.
2. An invitation to bring ancient geometry into clinical reality.
3. An invitation to rethink healing as energy in balance.
   - Let the research continue.
   - Let the vision expand.
   - Let the healing begin.

XX. Conclusion: The Awakening of a New Healing Paradigm

As this research journey reaches its formal conclusion, it does not mark an end-but rather the ignition of a profound beginning. Pyramid Energy Therapy (PET), once considered a mystical relic of forgotten civilizations, now stands at the intersection of empirical science and visionary medicine. What began as a hypothesis rooted in geometry and energy has evolved into a blueprint for a new chapter in integrative oncology.

We have explored the possibilities that geometry may speak a language far deeper than structure-that it may, in fact, orchestrate harmony within the living body through subtle energetic codes. We have examined ancient echoes and modern resonance, theoretical models and experimental glimpses, in search of a truth that dares to transcend conventional boundaries.

If this research has shown anything, it is that healing is not confined to chemicals or machines-it may also be encoded in form, in frequency, in the silent intelligence of shape. The pyramid, in this vision, is not merely a monument of stone, but a whisper from the universe inviting us to look again at the fundamentals of life.

Let this work be an invitation, not a declaration. Let it spark questions more than answers, curiosity more than certainty. For in that space of inquiry-between what we know and what we dare to explore-lies the real medicine of the future.

The vision of PET is not one of replacement but of resonance. It seeks to live alongside modern medicine, not against it. To offer new hope where the old paths falter. To illuminate possibilities that have long been dismissed as speculative, yet are now emerging through the cracks of the known.

In the end, this is not just a scientific exploration. It is an awakening.

Funding Statement: No external funding was received for this study.

Acknowledgments: The author thanks his wife for her emotional support and inspiration during the preparation of this manuscript.

Conflict of Interest Statement: The author declares no conflict of interest.

Ethical Approval: Not applicable.

Informed Consent: Not applicable.

Data Availability Statement: All data generated or analyzed.

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Foundational Principle of the Research

- All matter, whether living or non-living, can be understood as a form of energy organized in specific patterns.
- At the most fundamental level, any substance can be deconstructed into molecules, atoms, and subatomic particles.
- Atoms consist of protons (positive charges) and electrons (negative charges), and these electric charges are essentially manifestations of energy.
- Thus, the fundamental building block of matter is a pair of energetic opposites-positive and negative energy states-organized into structured units we call atoms.
- The diversity of elements arises from the specific configurations of these energy units, giving rise to the periodic table.
- These elements combine to form compounds and materials that constitute the microscopic structure of all living cells.
- A living cell, therefore, can be described as a highly organized and balanced network of energy units in dynamic equilibrium.
- When this energy balance is disturbed, as in the case of cancer cells, the cellular function becomes erratic and destructive.
- The hypothesis of this research proposes that restoring energetic equilibrium to a diseased cell-especially a cancer cell-could return it to normal function.
- This approach aims to heal the cell without causing the collateral damage associated with conventional therapies like chemotherapy or radiation.
- It opens the door to exploring new, non-invasive, energy-based methods for treating cancer at its foundational energetic level.

Figure 30

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Financial

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Associates are authorized to organize symposium/seminar/conference on behalf of Global Journal Incorporation (USA). They can also participate in the same organized by another institution as representative of Global Journal. In both the cases, it is mandatory for him to discuss with us and obtain our consent. Additionally, they get free research conferences (and others) alerts.

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Exclusive | Financial

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Associate	Fellow	Research Group	Basic
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Preferred Author Guidelines

We accept the manuscript submissions in any standard (generic) format.

We typeset manuscripts using advanced typesetting tools like Adobe In Design, CorelDraw, TeXnicCenter, and TeXStudio. We usually recommend authors submit their research using any standard format they are comfortable with, and let Global Journals do the rest.

Alternatively, you can download our basic template from https://globaljournals.org/Template

Authors should submit their complete paper/article, including text illustrations, graphics, conclusions, artwork, and tables. Authors who are not able to submit manuscript using the form above can email the manuscript department at submit@globaljournals.org or get in touch with chiefeditor@globaljournals.org if they wish to send the abstract before submission.

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Authors must ensure the information provided during the submission of a paper is authentic. Please go through the following checklist before submitting:

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3. Ensure corresponding author's email address and postal address are accurate and reachable.
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7. Manuscript submitted *must not have been submitted or published elsewhere* and all authors must be aware of the submission.

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It is required for authors to declare all financial, institutional, and personal relationships with other individuals and organizations that could influence (bias) their research.

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Unless specified in the notification, the Editorial Board's decision on publication of the paper is final and cannot be appealed before making the major change in the manuscript.

Acknowledgments

Contributors to the research other than authors credited should be mentioned in Acknowledgments. The source of funding for the research can be included. Suppliers of resources may be mentioned along with their addresses.

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Preparing your Manuscript

Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.

Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11'", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.

Format Structure

It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

All manuscripts submitted to Global Journals should include:

Title

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Keywords

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, “What words would a source have to include to be truly valuable in a research paper?” Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.

Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

Preparation of Eletronic Figures for Publication

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

Tips for writing a good quality Medical Research Paper

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.

6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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ISSN 9755896