

**Summer Training at  
MSN Laboratories Pvt. Ltd, Hyderabad, Telangana  
(April 3 to June 2, 2017)**

**Market Investigation of Lurasidone and Levetiracetam**

**By  
Paras Preet Singh**

**Under the guidance of  
Dr. Ashok Peepliwal**

**MBA Pharmaceutical Management  
2016-2018**

 **IIHMR UNIVERSITY**  
*School of Pharmaceutical Management*  
**The IIHMR University, Jaipur**  
**2017**

**CERTIFICATE**

This is to certify that **Mr. Paras Preet Singh** has undergone summer training in **MSN Laboratories** from 5<sup>th</sup> April to 30<sup>th</sup> June 2017.

The candidate himself had completed the project assigned to him during summer training. His approach to the project was sincere and proactive. This summer training is in partial fulfillment of the course requirement recommended for the award of MBA in Pharmaceutical Management.

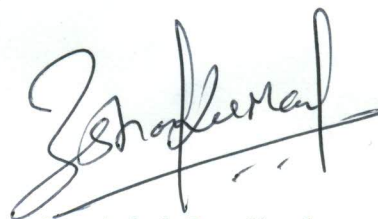
I wish her success in all his future endeavors.



Col. (Dr.) Ashok Kaushik

Dean (Academic & Student Affair)

The IIHMR University, Jaipur  
Jaipur



Dr. Ashok Peepliwal

(Assistant Professor)

The IIHMR University,

## MSN Laboratories Private Limited

MSN House, Plot No.: C-24,  
Sanath Nagar Industrial Estate, Sanath Nagar,  
Hyderabad, Telangana, Pincode: 500018. India.  
CIN: U24239TG2003PTC041583  
Phone: +91-40-30438600 Fax: +91-40-30438798

March 31, 2017

To  
Dr. Sandeep Narula  
IIHMR University,  
Jaipur.

Dear Sir/Madam,

This has reference to your letter, where in you have requested us to permit **Mr. Paras Preet Singh** do the project work in our organization.

We are pleased to permit him to do the project work in our organization from **April 6, 2017 to June 30, 2017** in **Sales & Marketing-Domestic Department at Delhi**. His project guide will be Mr. Girish Misra - Sales Manager for North & West.

Please note the following points:

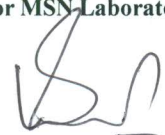
1. The Project will be decided by the company.
2. He is not entitled for any type of stipend during the course of the project work from the company.
3. The company shall have no liability for compensation whatsoever for any injury/accident arising out of or in the course of the project.
4. The candidate is liable to conform to company policies and procedures, rules, working timings and general work practices, which are subject to change from time to time
5. The candidate is responsible for the safe keep and return in good condition and order, of all property such as tools, equipment, instruments, books, uniforms etc., which may be in his use, custody, care or charge. The company shall have the right to deduct the monetary value of all such things from his dues and take such other action, as we deem proper in the event of his failure to account for such property to our satisfaction.
6. During the period of project work, his services are subject to termination without any notice or assigning any reason.
7. It is also understood that he would adhere to all rules and regulations applicable for the successful and timely completion of his assignment.

We welcome your student on behalf of our organization and hope that the structured learning experience provided to him will benefit your student and the cause of Professional Management.

Thanking you,

Yours truly,

for MSN Laboratories Private Limited

  
P Srinivas  
Senior Manager - HR





## MSN Laboratories Private Limited

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Hyderabad, Telangana, Pincode: 500018. India.  
CIN: U24239TG2003PTC041583  
Phone: +91-40-30438600 Fax: +91-40-30438798

July 17, 2017

### TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr Paras Preet Singh**, s/o Satwinder Singh Walia bearing Registration No: 0074 from IIHMR University, Jaipur has successfully completed his project work in our Formulation Marketing Department on "**Post Marketing Assessment of Lurasidone and Levetiracetam**" at MSN Laboratories Pvt. Ltd under the guidance of **Mr. Girish Misra - Sales Manager, CNS Division** from 6th April, 2017 to 30th June, 2017.

During Project work **Mr Paras Preet Singh** Performance was found satisfactory.

for MSN Laboratories Pvt. Ltd

P Narsimha Rao  
Senior Vice President - Group HR

# **ABSTRACT**

## **Background:**

Previous studies have shown that the incidence of patient impairment and preventable death due to medical errors is inadmissibly high.

## **Aim:**

To study the market sales of Lurasidone and Levetiracetam drug.

To know the doctors' behavior for prescribing Lurasidone and Levetiracetam drug.

## **Methodology:**

This study was designed as a descriptive and cross-sectional study and the sample included total 100 doctors including Neuro physicians, Neuro surgeons and Psychiatricians. The study data were collected with a Structured Questionnaire form. The data were analyzed with Microsoft Excel.

## **Results:**

- 49%-38% of the doctors had Good to moderate response from the Lurasidone and were quite happy and willingly prescribing the drug to the schizophrenic patients and patients with Bipolar depression.
- 48% of the doctors firstly think of Levetiracetam drug for the treatment of Anti-epileptic patients and so on.

## **Conclusion:**

Lurasidone and Levetiracetam both were doing very well in the market and were even appreciated by the doctors at every point. Hence, the drug was making self-position in the market higher than that of other drugs.....

# **ACKNOWLEDGEMENT**

Very firstly I am thankful to THE ALMIGHTY that I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organization. I would like to extend my sincere thanks to all of them.

I am highly indebted to **Dr. Ashok Peepilwal**, for his guidance and constant supervision as well as for providing necessary information regarding the project and for his support in completing the report. I would like to express my gratitude towards my parents and members of IIHMR University for their kind co-operation and encouragement which helped me in completion of this report. I would like to express my special gratitude and thanx to my classmates for giving me such attention and time.

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## **INTRODUCTION:**

The Indian pharmaceuticals market is the third largest in terms of volume and thirteenth largest in terms of value, as per a report by Equity Master. India is the largest provider of generic drugs globally with the Indian generics accounting for 20 per cent of global exports in terms of volume. Of late, consolidation has become an important characteristic of the Indian pharmaceutical market as the industry is highly fragmented.

India enjoys a prominent position in the global pharmaceuticals sector. The country also has a large pool of scientists and engineers who have the potential to steer the industry ahead to an even higher level. Presently over 80 per cent of the antiretroviral drugs used globally to combat AIDS (Acquired Immuno-Deficiency Syndrome) are supplied by Indian pharmaceutical firms.

The UN-backed Medicines Patent Pool has signed six sub-licenses with Aurobindo, Cipla, Desano, Emcure, Hetero Labs and Laurus Labs, allowing them to make generic anti-AIDS medicine Tenofovir Alafenamide (TAF) for 112 developing countries.

The government started to encourage the growth of drug manufacturing by Indian companies in the early 1960s, and with the Patents Act in 1970. However, economic liberalization in 90s by the former Prime Minister P.V. Narasimha Rao and the then Finance Minister, Dr. Manmohan Singh enabled the industry to become what it is today. This patent act removed composition patents from food

and drugs, and though it kept process patents, these were shortened to a period of five to seven years.

The Lack of patent protection made the Indian market undesirable to the multinational companies that had dominated the market. Whilst the multinationals streamed out, Indian companies carved a niche in both the Indian and world markets with their expertise in reverse-engineering new processes for manufacturing drugs at low costs. Although some of the larger companies have taken baby steps towards drug innovation, the industry as a whole has been following this business model until the present.

India's biopharmaceutical industry clocked a 17 percent growth with revenues of Rs.137 billion (\$3 billion) in the 2009-10 fiscal year over the previous fiscal. Biopharma was the biggest contributor generating 60 percent of the industry's growth at Rs. 8,829 crores, followed by bio-services at Rs. 2,639 crores and bio-agri at Rs. 1,936 crores.

## **Market Size**

The Indian pharma industry, which is expected to grow over 15 per cent per annum between 2015 and 2020, will outperform the global pharma industry, which is set to grow at an annual rate of 5 per cent between the same period. The market is expected to grow to US\$ 55 billion by 2020, thereby emerging as the sixth largest pharmaceutical market globally by absolute size, as stated by Mr Arun Singh, Indian Ambassador to the US. Branded generics dominate the pharmaceuticals market, constituting nearly 80 per cent of the market share (in terms of revenues).

India has also maintained its lead over China in pharmaceutical exports with a year-on-year growth of 11.44 per cent to US\$ 12.91 billion in FY 2015-16, according to data from the Ministry of Commerce and Industry. In addition, Indian pharmaceutical exports are poised to grow between 8-10 per cent in FY 2016-17. Imports of pharmaceutical products rose marginally by 0.80 per cent year-on-year to US\$ 1,641.15 million.

Overall drug approvals given by the US Food and Drug Administration (USFDA) to Indian companies have nearly doubled to 201 in FY 2015-16 from 109 in FY 2014-15. The country accounts for around 30 per cent (by volume) and about 10 per cent (value) in the US\$ 70-80 billion US generics market.

India's biotechnology industry comprising bio-pharmaceuticals, bio-services, bio-agriculture, bio-industry and bioinformatics is expected grow at an average growth rate of around 30 per cent a year and reach US\$ 100 billion by 2025. Biopharma, comprising vaccines, therapeutics and diagnostics, is the largest sub-sector contributing nearly 62 per cent of the total revenues at Rs12,600 crore (US\$ 1.89 billion).

## **Neurology-The current scenario in India**

The last decade has seen remarkable advances in the diagnostic and therapeutic abilities of the neurologists. Key diagnostic tests like the scans and advanced blood based tests have become available throughout India. As a result, the diagnostic accuracy has increased. The therapeutic armamentarium of the neurologists has significantly widened over the years. More and more diseases are coming under the umbra of modification and cure. Neuro-immunological

disorders are being altered favorably. Neurogenetics has also begun to take roots in India and slowly, genetic disorders are being diagnosed locally. As the preventive aspects of the genetic diagnosis will be expedited soon, the full scope of genetic diagnosis will become apparent. While these developments are taking place, concerns about the limitations of the neurology workforce in India and its uneven distribution throughout the country remain unchanged and therefore it is important to nurture the physician and neurologist partnership in India to provide quality health care uniformly. This article will focus on the current situation of common neurological diseases and touch upon some aspects of the neurology health care.

### **Neurological Disorders:**

The spectrum of neurological disorders seen in India is like that of other parts of the world with some regional differences. Strokes Stroke is a major health problem in India.<sup>1</sup> The average annual incidence rate of strokes in a recent study from Kolkata was 145 per 100,000 population which compares well with the developed countries. Stroke burden has been rising in India as compared to the developed countries where it has reached plateau or decreased. Overall, ischemic strokes account for about 80% of all strokes in India<sup>4</sup> and intracranial atherosclerosis tends to be commoner in Indian people. The therapy of ischemic strokes in the initial few hours has changed dramatically. The possibility of thrombolysis exists in every patient who reaches the medical setups within 4.5 hours of having had the event. Delivery of thrombolytic therapy requires a CT scan, and informed neurologist or a physician. The exclusion and inclusion criteria have now been well worked out and do not require further instrumentation. The

window for intravenous thrombolysis has been recently widened to 4.5 hours. However, realistically, only a small proportion of stroke patients can avail of this therapy. The reasons are multiple. The awareness of the community about reaching the hospital early in case of a paralytic stroke is still wanting. The initial manifestations of a paralytic stroke are not well recognized by people at large. Transient ischemic attacks are often neglected because symptoms tend to improve. Further interaction of medical individuals with the public is very necessary to improve this awareness. The decision for thrombolysis must be taken very quickly and hence the setups need to be geared for this therapy, which is currently possible only in a few centres. More advanced therapies like intra-arterial thrombolysis and mechanical ablation of the clot are available only in few tertiary care centres. Carotid endarterectomy, aneurysm coiling and carotid stenting are getting established slowly in various tertiary centres in India. Different specialties like interventional neuroradiology, cardiology, neurology, neurosurgery and intensive care medicine participate in these interventional procedures. While the participation of multiple specialties is welcome to an extent, such turf battles hinder the development of excellence, as individuals take much longer time to get over their learning curves. Development of specialized stroke units will increase the yield.

## **Epilepsy**

Recent community-based surveys have shown that epidemiological indices of epilepsy in India are comparable to those from developed countries, with a prevalence rate of ~5 per 1000 and incidence rate of ~50 per 100,000.<sup>7,8</sup> While the pattern of epilepsy seen in India is comparable to that in the other parts of the world, epilepsies related to neuro infections, trauma and perinatal difficulties seem to be more prevalent in local situation. Due to the shortage of neurologists

and physicians in rural India, large numbers of epilepsy patient either do not receive therapy at all or tend to receive polypharmacy in irrational formats. In the context of the whole country, the treatment gap percentage of individuals who are treated is still very large being about 70%. The discontinuation rate is also very high. On the other hand, there are encouraging aspects to the epilepsy care in India. The epilepsy Society of India, with its wide networking, has helped increasing the awareness of epilepsy in the society and thereby, to an extent, has reduced the stigma. A wide variety of antiepileptic drugs are available to us in India and hence the choices are comparable to those on the international scene. As many of these drugs are manufactured in our own country, the costs are favorable to the patients. With the frequent use of CT scan and MRI scan, Lesions are being diagnosed earlier and therefore the outcomes have improved. Several centers have now developed epilepsy surgery programs and pre-and peri operative evaluation has improved. Lesional epilepsy surgeries are gaining more popularity and are being offered earlier, as the results keep improving.

## **BACKGROUND:**

In 1960s Neuro-epidemiological studies in India were restricted to single disorders such as epilepsy and stroke and it was only two decades later that community-based studies for a spectrum of neurological disorders were initiated in Bangalore, Bombay, Delhi and Kashmir which provided the foundation and frame work for the emergence of the discipline of neuroepidemiology in India. To overcome the major constraint of few neurologists in developing countries and also to optimize the time spent by the neurologist, Schoenberg recommended strategy of two-stage methodology; the first stage comprised of administration of questionnaire of symptoms and simple clinical examination by health care

personnel and second stage examination by neurologist of individuals identified as having neurological disorder. The Neuroscience program of World Health Organization (WHO) developed the screening questionnaire "WHO protocol" to detect individuals with epilepsy, cerebrovascular disorders, peripheral neuropathy, extrapyramidal disorders (including Parkinson's disease) migraine and intracranial neoplasms and was pilot tested in Nigeria. Gourie-Devi *et al.*, observed that in the Indian context clinical examination by non-medical professionals was not acceptable to the people, hence only the questionnaire was administered by trained field workers and neurological examination of 'screened positive' subjects was done by neurologist. They further modified and expanded the WHO screening questionnaire to include a wider spectrum of neurological disorders and using this instrument NEPSIG (Neuro Epidemiological Study in Gowribidanur) through a two-stage method of survey, the feasibility and logistics in identifying neurological disorders in a population of 57660 comprising of urban and rural population of Gowribidanur town and the surrounding villages, was demonstrated. Arguably all these pioneering efforts galvanized and sensitized the neurologists in the country to the discipline of neuroepidemiology and Indian Council of Medical Research (ICMR) identified neuroepidemiology as a thrust area of research and has been providing grants in a task force mode of support. Certain important concerns were the problems in comparing the data emanating from different regions of the country and the pitfalls identified were small sample size not representative of the population, lack of uniformity in case finding, case ascertainment, training of field workers, standardized screening questionnaires and definitions of diseases. These methodological issues have been dealt with at length through a format of questions and answers for conducting neuro epidemiological surveys in a developing country. To overcome these lacunae a comprehensive Manual was developed at the National Institute of Mental Health

and Neurosciences (NIMHANS) with support from ICMR, with focus on logistics and operational aspects of conducting neuro-epidemiological survey in a developing country including selection of study population, structured training program of field workers, screening questionnaires for adults and children and definition of diseases. These questionnaires were validated in a pilot study by Gourie-Devi *et al.*, and later used in the major **Bangalore Urban-Rural Neuro-epidemiological** (BURN) survey. Standardized questionnaires developed by NIMHANS, with minor modifications, based on requirements of the survey and local situation, have been used in neuro-epidemiological studies in different regions of the country. It is heartening that the concerns articulated by the author in late 1980s "Can India afford neuroepidemiology" have been firmly dispelled.

### **Prevalence of epilepsy**

The global burden of disease study of 2000 provides an estimate of 50 million people with epilepsy and more than 80% of them in developing countries. In India Epilepsy was included in mental morbidity surveys during 1960s and 1970s which were conducted by psychiatrists in different regions of the country with research grant from ICMR [Table 3]. Crude prevalence rate varied from 2.2-10.4 per 1000 population. The concerns were the small sample size in all, except one, of these studies and the definition of epilepsy was not included. It is also not clear if only 'active epilepsy' was included and whether the questionnaire was formulated to detect generalized, focal and complex partial seizures. In this context, it is pertinent to acknowledge the commendable contribution of psychiatrists for including epilepsy to provide primary care under the National Mental Health Program (NMHP) initiated in 1982 and now further expanded to include more than 200 districts by Government of India. A significant mile stone was the multi center "Collaborative epidemiological study of epilepsy in India", PL 480 funded

project of ICMR, which was initiated in 1969 and included, Bangalore, Bombay, Calcutta, New Delhi and Madras. Although this was hospital based, the study provides valuable data on clinical parameters, electroencephalographic, and psychosocial aspects and follows up over 4 years. From 1968-2008, fourteen surveys have been done in different regions of the country to determine the prevalence of epilepsy [Table 4]; four of them comprising both urban and rural population, seven only rural population and three only urban population [were included. Most of the studies are from North, South and East India, one report from West India but none from vast regions of Central and North-East regions. In the earlier studies the WHO questionnaire and in the last decade NIMHANS questionnaire has been used for survey. The mean crude prevalence rate was 5.7 per 1000 population (range 2.5-11.9) for the entire surveyed population; 5.3 (2.5-7.5) in urban population and slightly higher rate of 5.8 (2.5-11.9) in rural population. There was no significant difference in rates between men and women. The peak prevalence rates were in the second and third decades and a second peak in the elderly due to occurrence of seizures due to stroke. In a meta-analysis published 15 years ago, Sridharan and Murthy reported similar overall prevalence of 5.3/1000; in urban areas, it was 5.1 and in rural area was 5.5/1000. The slightly higher rates currently observed may be due to the recent surveys reporting higher prevalence in rural area attributed to neuro-cysticercosis (NCC) contributing to a significant proportion of seizures in the community. In population based surveys only two studies focused on NCC contributing to prevalence of epilepsy. In the study from Vellore, South India 34% of patients with active epilepsy were confirmed to have NCC by CT scan and enzyme-linked immune transfer blot (EITB) and from Dehradun, North India, 35% had NCC based only on CT scan. It is interesting to note that the overall prevalence rate of epilepsy has almost

remained constant over the last two decades. Based on the prevalence data it is estimated that there are 6 to 8 million people with epilepsy in India.

**Table.3 Prevalence rates of epilepsy based on mental morbidity surveys from 1962 to 1976 (per 1000 population)**

| Author                | Year of survey | Region      | Place       | Type of population | Population size | Crude rate | Comment                                              |
|-----------------------|----------------|-------------|-------------|--------------------|-----------------|------------|------------------------------------------------------|
| Surya <sup>[34]</sup> | 1962           | South india | Pondicherry | Urban              | 2730            | 2.2        | Mental morbidity survey;house to house;questionnaire |
| Dube <sup>[35]</sup>  | 1962           | North india | Agra        | Urban and rural    | 29468           | 2.24       | Mental morbidity survey;house to house;questionnaire |
| Sethi <sup>[36]</sup> | 1962           | North india | Lucknow     | Rural              | 2691            | 2.2        | Mental morbidity survey;questionnaire                |
| Nandi <sup>[37]</sup> | 1975           | East india  | West Bengal | Rural              | 3718            | 4.6        | Mental morbidity survey;questionnaire                |

**Table.4 Prevalence rates of epilepsy based on Neuro-epidemiological surveys conducted from 1968 to 2008 (per 1000 population).**

| Author                        | Year of survey | Region      | Place state               | Type of population | Population size | Crude rate | Comment                                                     |
|-------------------------------|----------------|-------------|---------------------------|--------------------|-----------------|------------|-------------------------------------------------------------|
| Mathai <sup>[8]</sup>         | 1968-1969      | South india | Vellore<br>Tamil Nadu     | Total              | 45778           | 9.0        | Questionnaire                                               |
|                               |                |             |                           | Urban              | 16135           | 7.5        |                                                             |
|                               |                |             |                           | Rural              | 29643           | 9.8        |                                                             |
| Gourie- Devi <sup>[10]</sup>  | 1982-1983      | South india | Gowribidanur<br>Karnataka | Total              | 57660           | 4.6        | NEPSIG protocol                                             |
|                               |                |             |                           | Semiurban          | 17734           | 2.5        |                                                             |
|                               |                |             |                           | Rural              | 39926           | 5.6        |                                                             |
| Bharucha <sup>[41]</sup>      | 1985           | West india  | Bombay<br>Maharashtra     | Urban-Parsis       | 14010           | 4.7        | Special group-parsis WHO Questionnaire                      |
| Koul <sup>[42]</sup>          | 1986           | North india | Kuthar valley<br>kashmir  | Rural              | 63645           | 2.5        | WHO questionnaire                                           |
| Kapoor <sup>[13]</sup>        | 1986           | North india | Ballabgarh<br>Haryana     | Rural              | 48798           | 4.0        | WHO questionnaire                                           |
| Das <sup>[27]</sup>           | 1989-1990      | East india  | Malda<br>West Bengal      | Rural              | 37286           | 3.0        | WHO questionnaire                                           |
| Mani <sup>[43]</sup>          | 1990-1991      | South India | Yelandur<br>Karnataka     | Rural              | 64963           | 7.6        | ICEBERG screening instrument-modified<br>Ep-4.6;<br>HWE-3.0 |
| Saha <sup>[28]</sup>          | 1992-1993      | East india  | South 24 parganas         | Rural              | 20842           | 3.6        |                                                             |
| Kokkat <sup>[44]</sup>        | 1993           | North india | Haryana                   | Rural              | 8595            | 5.6        | Questionnaire                                               |
| Gourie-devi <sup>[22]</sup>   | 1994-1995      | South india | Bangalore<br>Karnataka    | Total              | 102557          | 8.8        | NIMHANS questionnaire                                       |
|                               |                |             |                           | Urban              | 51502           | 5.8        |                                                             |
|                               |                |             |                           | Rural              | 51055           | 11.9       |                                                             |
| Radhakrishnan <sup>[45]</sup> | 1996-1997      | South india | Kerala                    | Semiurban          | 238102          | 4.9        | WHO questionnaire-modified                                  |
| Das <sup>[23]</sup>           | 2003-2004      | East india  | Kolkata<br>West bengal    | Urban              | 52377           | 5.6        | NIMHANS questionnaire                                       |
|                               |                |             |                           |                    |                 |            |                                                             |
| Rajsekhar <sup>[46]</sup>     | 2003-2004      | South India | Vellore<br>Tamil nadu     | Total              | 50617           | 3.8        | WHO questionnaire                                           |
|                               |                |             |                           | Urban              | 12512           | 6.2        |                                                             |
|                               |                |             |                           | Rural              | 38105           | 3.0        |                                                             |
| Goel <sup>[25]</sup>          | 2007-2008      | North india | Dehradun                  | Rural              | 14086           | 6.5        | NIMHANS questionnaire                                       |

HWE - Hot water epilepsy, ICEBERG - International community based epilepsy research group, NEPSIG - Neuroepidemiological study in gowribidanur, NIMHANS - National institute of mental health and neurosciences, WHO - World health organization

## **AIM OF THE INTERNSHIP**

### **RESEARCH QUESTION:**

What is the opinion of doctors' in prescribing Lurasidone and Levetiracetam?

### **OBJECTIVES:**

To study the market sales of Lurasidone and Levetiracetam drug.

To know the doctors' behavior for prescribing Lurasidone and Levetiracetam drug.

### **ORGANIZATIONAL PROFILE:**

Founded in 2003, the Hyderabad based MSN Laboratories is one of the fastest growing research-based pharmaceutical company in India. Boasting a diverse product portfolio, with multiple products in the market and in the pipeline, MSN has 8 API (including Oncology) and 3 finished dosage facilities (including one for oncology) and an integrated R&D Center for Contract Research and Manufacturing Services (CRAMS) located in Hyderabad

MSN has won the trust of more than 250 customers across 65 countries around the globe covering the US, Europe, Latin America, Middle-East, Asia Pacific, Africa and CIS markets. Our product basket offers over 200 APIs & 120 Formulations covering 35 major therapies.

Innovation & speed form the core of our business strategy (by mosley). Pro-active marketing, robust IP strategy, innovative R&D expertise, dynamic SCM, insight driven IT and world class capabilities are our ingredients to success.

With a dedicated & experienced team of over 3500, the organizational environment at MSN integrates multiple disciplines and functions by exhaustive communication of goals and objectives through technology and values of Integrity, Imagination & Innovation.

We have grown from USD 0 to USD 250 million in just 12 years.

With an outstanding workforce, cutting-edge science, state-of-the-art technology base and knowledge intensive initiatives, we are working on innovative solutions for tomorrow`s healthcare problems.

**Research & Development** (R&D) forms the very basis of MSN. It is the wind beneath our wings. The aim of R&D at MSN is to work on solutions that offer a hope for a better tomorrow. With an outstanding workforce, cutting-edge science, state-of-the-art technology base and knowledge intensive initiatives, we are working on innovative solutions for tomorrow`s healthcare problems.

## **Our Vision**

We would like to be the preferred supplier of quality Pharmaceuticals to global markets complying to international regulatory requirements and aim for the highest possible customer satisfaction.

## **Our Mission**

To discover, develop, manufacture, market safe and innovative pharmaceuticals for better health and improved quality of life

To be a true world class, reliable pharmaceutical company and manufacture pharmaceuticals that effectively and safely alleviate, treat and prevent diseases

Instill greater team spirit and generate motivation and pride

### **Our Social Responsibility**

We have always been very conscious about our societal responsibilities and we have made ourselves available for the betterment of the society with various activities.

India will be the diabetic capital of the world by 2025. There will be more than 230 million Diabetics by that time. Every 10 seconds 1 person in the world dies with Diabetes. Most disturbing fact is that half of all the Diabetics in the world do not even know that they have it.

So, far MSN has conducted 300 Camps, screened a quarter million people, of which 50,000 have been diagnosed to be diabetic.

### **Recognitions / Awards**

- MSN Laboratories Wins National Intellectual Property(IP) Award 2016.
- MSN Laboratories Wins Pharmaexcil's Patent Award 2015
- MSN Laboratories has been awarded TV5 Business Leader award 2015 in the Pharmaceutical (Medium Scale) category.
- PHARMEXCIL (Pharmaceutical Export Promotion Council) Outstanding Export Performer Award, 2009 & 2010
- FAPCCI Outstanding Export Performance Award in 2010
- ICICI-CNBC TV18-CRISIL Emerging India Award 2010 for pioneering 'systems focus' in the pharmaceutical sector.

- Udyog Ratan Award.
- MSN has won the Customer Centric Business Partner Award from Abbott Healthcare Pvt. Ltd. for the year 2012.

## **METHODOLOGY**

Sample size : 50 (For Lurasidone), 50 (For Levetiracetam).

Sampling method : Probability Sampling.

Technique Used : Structured Questionnaire.

Type of data : Primary data was referred.

Type of study : Quantitative Study was done.

Study location : Chandigarh, Mohali and Ludhiana.

Study Duration : 3<sup>rd</sup> April to 5<sup>th</sup> June.

## **ANALYSIS:**

### **Nature of the sample:**

This section deals with the analysis of the opinions given by the neuro physicians, neuro surgeons and psychiatrics on the prescribing preferences of Lurasidone and Levetiracetam over other drugs in Schizophrenia/Bipolar depression and Epilepsy respectively.

**Sample size** : 50 (For Lurasidone), 50 (For Levetiracetam).

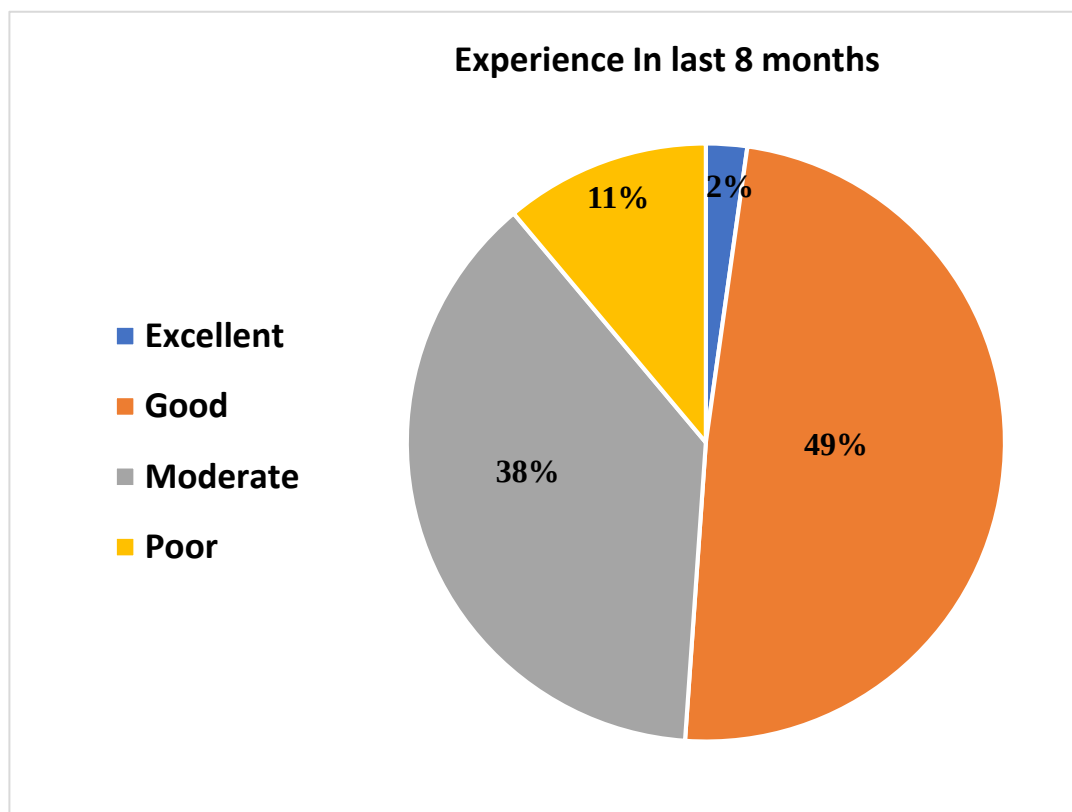
**Respondents** : 45 (For Lurasidone), 34 (For Levetiracetam).

**Total Respondents** : 79/100.

The analysis of Lurasidone and Levetiracetam specifically aims in knowing the opinion and the prescribing pattern of doctors towards these drugs.

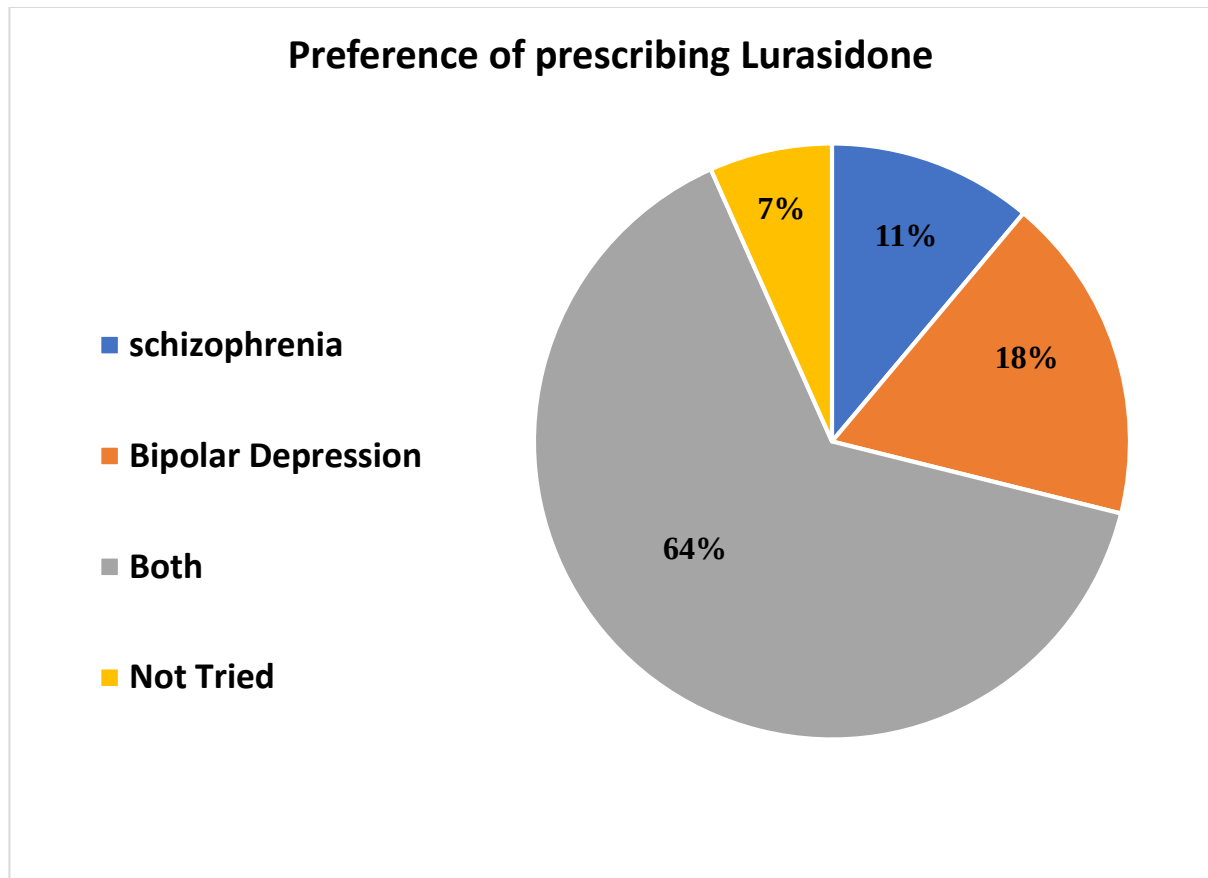
## **ANALYSIS OF LURASIDONE DRUG.**

For the analysis of Lurasidone drug, a Structured questionnaire was prepared consisting of various questions which were asked by the doctors to collect their valuable opinion. Several types of questions were asked from the structured questionnaire and their responses were recorded. Pie-charts were made accordingly from those responses and discussions were made on them.



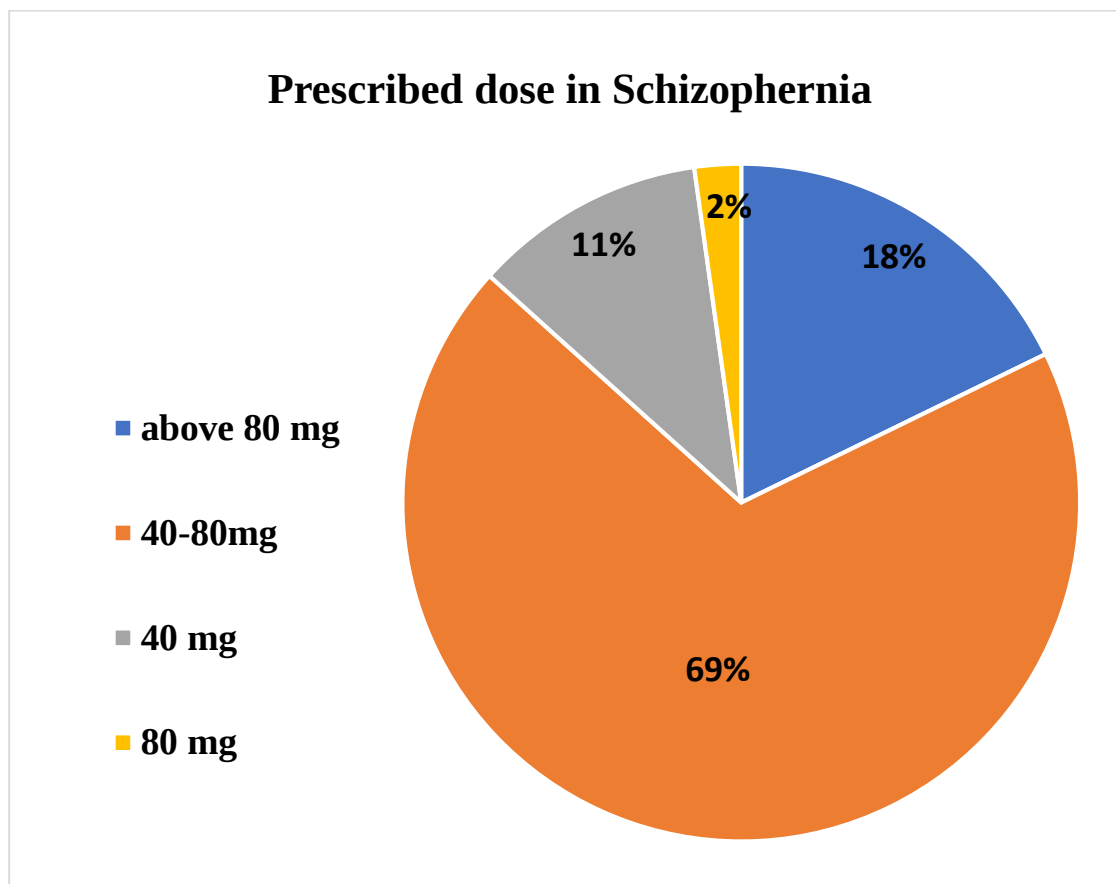
The discussion on the drug Lurasidone began with the doctor with the very first question from the structured questionnaire by asking the doctor about his/her past

8 months' experience on the performance of the drug lurasidone and the main motive about asking question was to see that how much were the doctors satisfied by this drug and how much are the drug was meeting the doctors' expectation level. Hence, conclusion made after asking this question was that 49% of the doctors said that they had a pleasant experience regarding the drug lurasidone and they were getting quiet good responses from the patients to those they had prescribed lurasidone. Whereas about 38% of the doctors received a moderate response and they were not very much satisfied with the drug and however others 11% and 2% responded as poor and excellent respectively. By this question, the conclusion that can be made was that from the total sample only 2% doctors were the non-switchers and are prescribing the drugs whereas 49% of the doctors were prescribing the drug but were searching even good responses from any other drug if possible they might switch to it and 11% were those who aren't prescribing the drug or prescribing in any rare cases, whereas 38% are frequent switchers and can easily switch to other drugs.



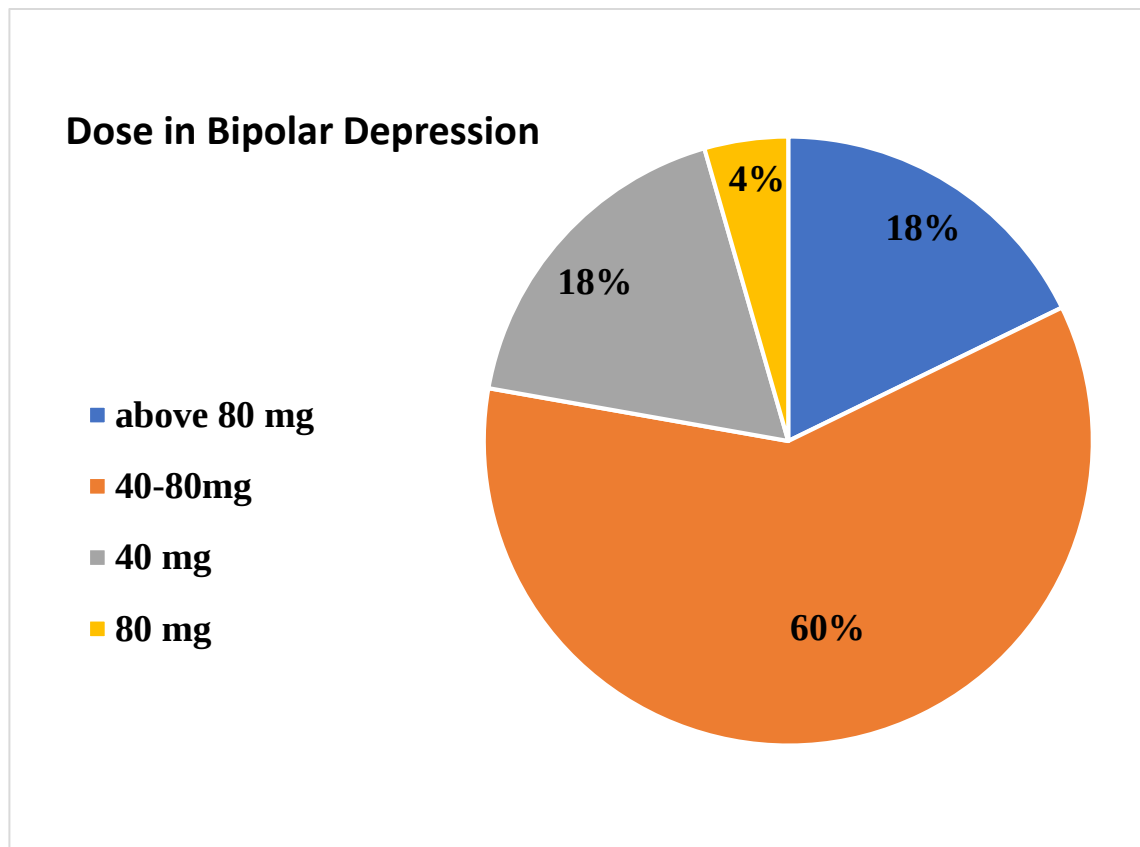
Heading towards the second question in the questionnaire, doctors were asked about their preference of prescribing lurasidone either in Schizophrenia or in Bipolar depression and after getting all the responses they were recorded to make a pie chart as shown above. From the pie chart, it is very clear that the doctors are prescribing lurasidone drug both in Schizophrenia as well as in Bipolar depression and holds for highest percentage in the pie chart i.e. 64% however there are doctors who were only prescribing lurasidone in certain conditions of Schizophrenia and Bipolar depression in the percentages of 11% and 18% respectively and another category of 7% was also found which were not even prescribing Lurasidone to the patients. So, from this questions conclusion made was that most of the doctors who were prescribing Lurasidone in both

schizophrenia as well as bipolar depression were seen as young doctors with updated drug knowledge where as those who were not even prescribing the drug or prescribing the drug in only one of the two cases, there was a need to make their knowledge update for this drug and also solve their queries so that they can start prescribing this drug.



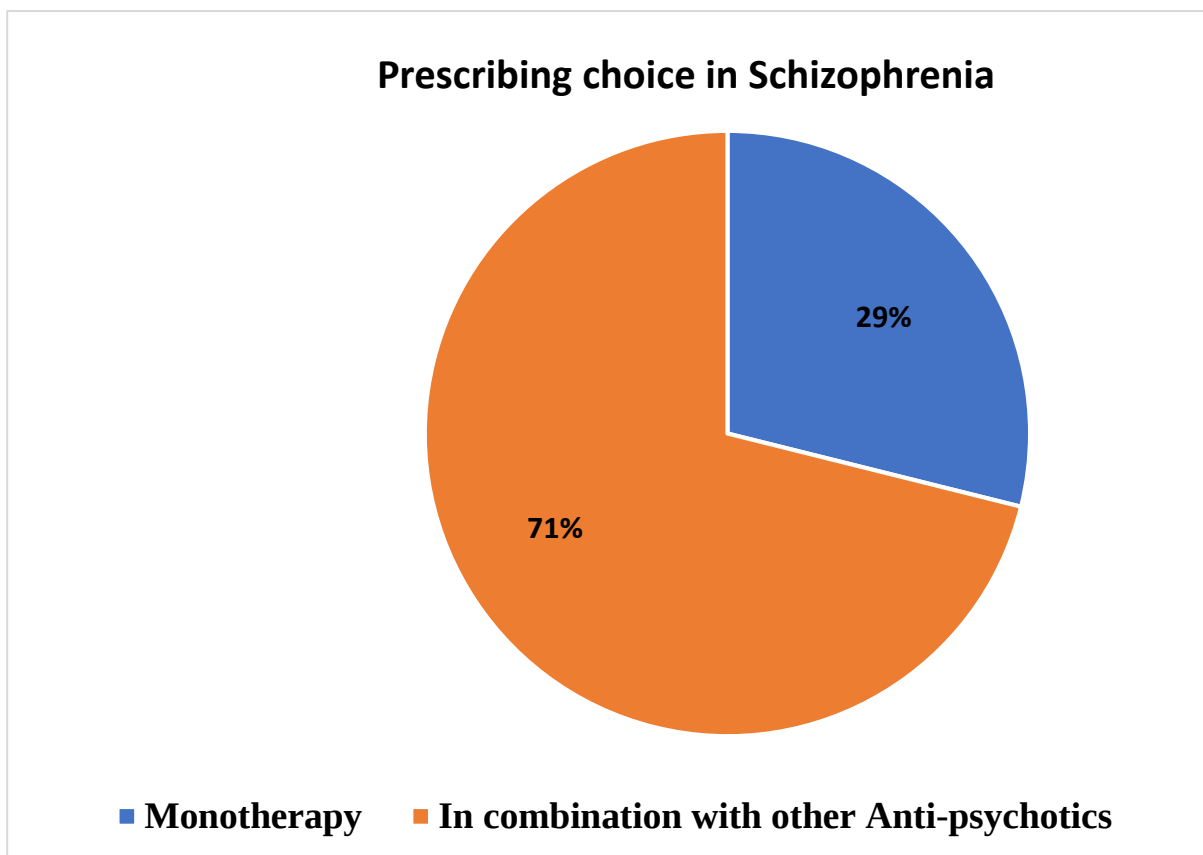
In continuation to the previous question, Doctors were asked about their opinion on the dose they prescribe to their patients in the cases of schizophrenia and doctors very well participated in this question along with their views and their opinions, the major segment for this question from the structured questionnaire were the category of 40 - 80mg with the view and opinion that it was very well

tolerated in patients and mostly there were getting responses in this category after which 18% of the doctors said that they prescribe a little higher dose than that of 80mg in some of the cases where in they weren't getting responses in prescribing low dose and 11% were the doctors who prescribe lower dose of lurasidone along with some other anti-psychotics so they prefer going with adjunct therapy for their patients however very few doctors prescribe 80 mg as monotherapy and in rare cases also as they quoted that treating the disease condition is not a cup of tea for only one drug so combination of drugs are prescribed.



Attached to the previous question, Doctors were again asked their choice of preference in prescribing the drug dose- lurasidone in bipolar depression and got the almost comparable results with a tie in 40mg and above 80 mg segment. In the case of Bipolar depression about 60% of the doctors are prescribing lurasidone in 40-80mg and getting good responses from the patients however the category of 80mg is low i.e. only accounts for 4% and both the categories, the one of above 80mg and 40 mg both accounts for 18%. From the above graph, it was concluded that very few doctors were prescribing lurasidone in cases of Bipolar Depression in dosage of 80mg. Mostly 40-80 mg of lurasidone is well tolerated in patients of bipolar depression. Hence there need to focus more on the market of Lurasidone

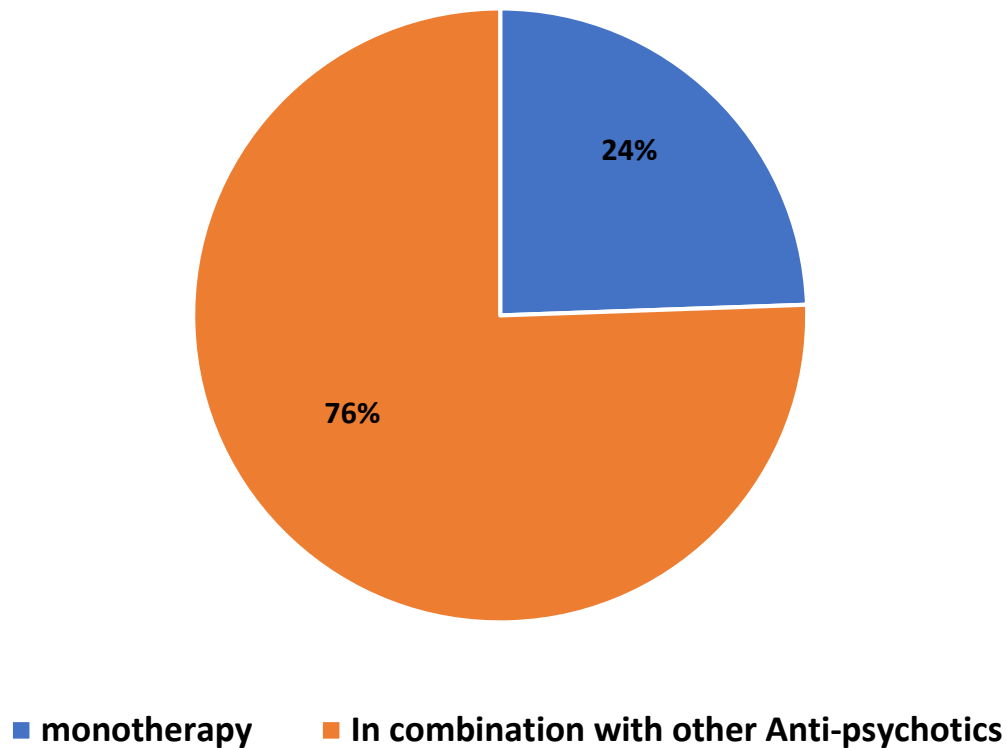
for the category of 40- 80 mg. Both the markets of 40 mg and above 80 mg are running side by side in the same pace. The main reason seen why the doctors weren't prescribing in the dose of 80mg as they are mostly prescribing the drugs in combination not monotherapy so if they were prescribing lurasidone 80mg along with other anti-psychotics as initial dose it may lead to outcome of side effects, however the prescription of lurasidone in above 80 mg segment was mostly prescribed as monotherapy.



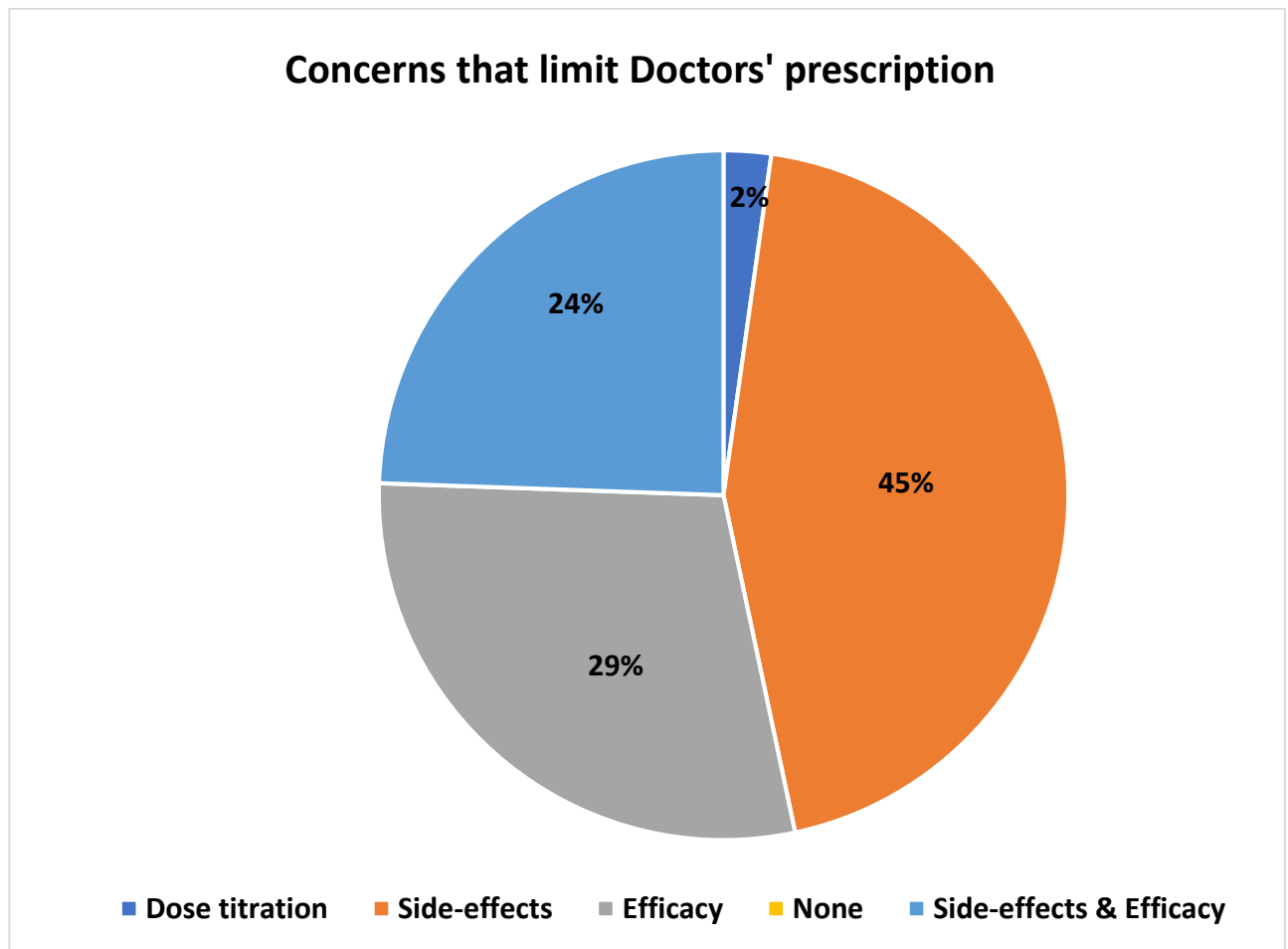
Then, doctors' opinion on prescribing lurasidone in monotherapy or they prefer prescribing in combination along with some other anti-psychotics and according to the collected data, it was found that 71% of the doctors were prescribing the

drug along with the other anti-psychotics i.e. in combination where as 29% of the doctors were prescribing the drug in monotherapy. The main reason why they were prescribing the drug in combination as they said that in Schizophrenia there were no. of symptoms which need to be treated in variety of combination of drugs however, in monotherapy higher doses of Lurasidone is given to the patient but not so often mostly the drug is prescribed in the dose of 40-80mg and hence combination is used.

### Prescribing choice in Bipolar depression

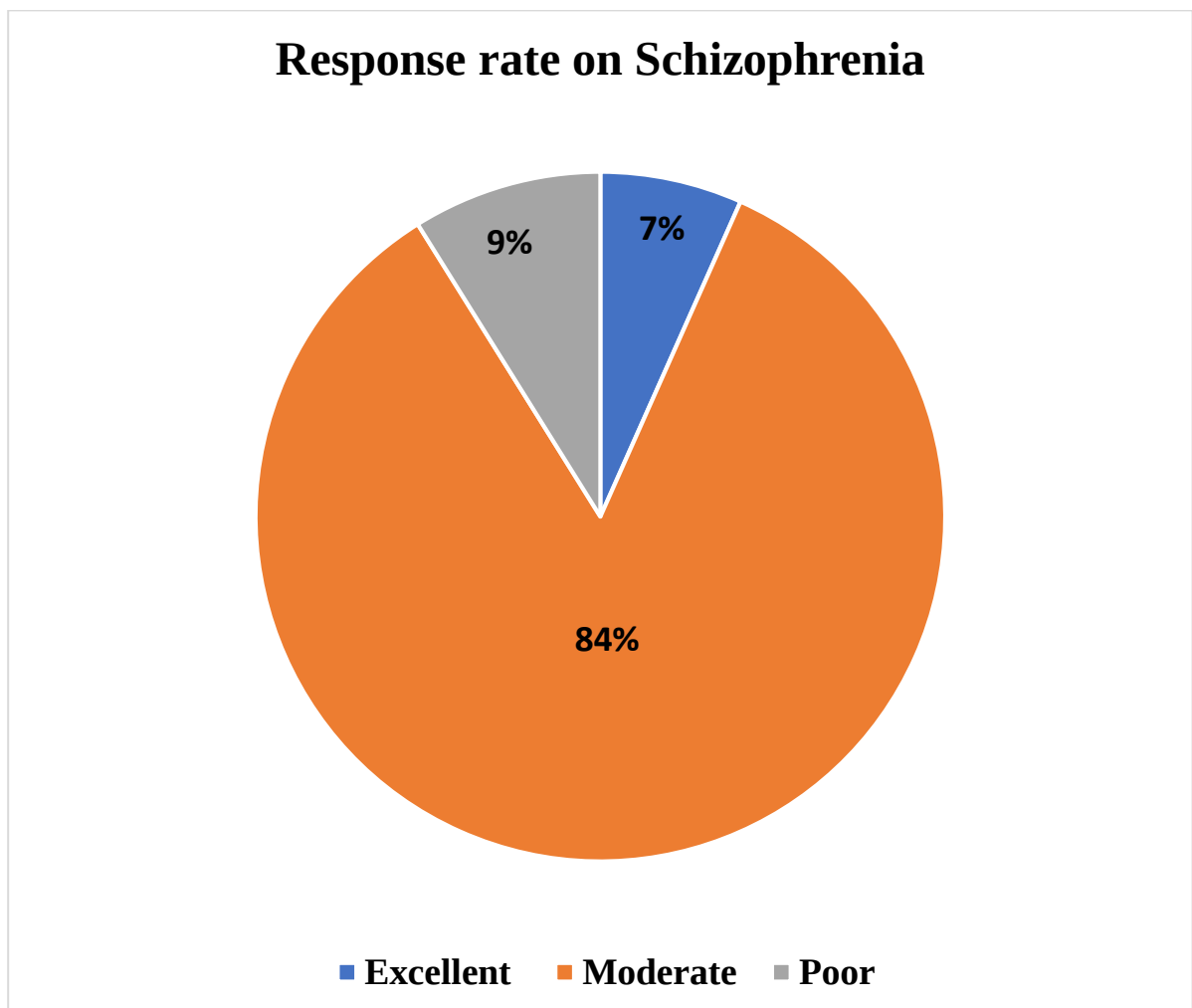


Same were in the case of the Bipolar Depression, the doctors were asked about their preference of prescribing lurasidone as a monotherapy treatment or in combination with other anti-psychotics the results founded from the data were that 76% of the doctors were prescribing the drug in combination and 24% were prescribing as the monotherapy treatment and the reason they quoted were the same that mostly the drug dose doctors prescribing was in 40-80mg and was one of the reasons why the market of lurasidone in the segment of 40-80mg was moving a bit faster as compared to above 80mg and 40 mg dosage forms. However, doctors were also seeking extended release dosage forms of the same drug and it was expected that once the extended release or the novel dosage forms will come into the market they will cover most the portion in the graph.

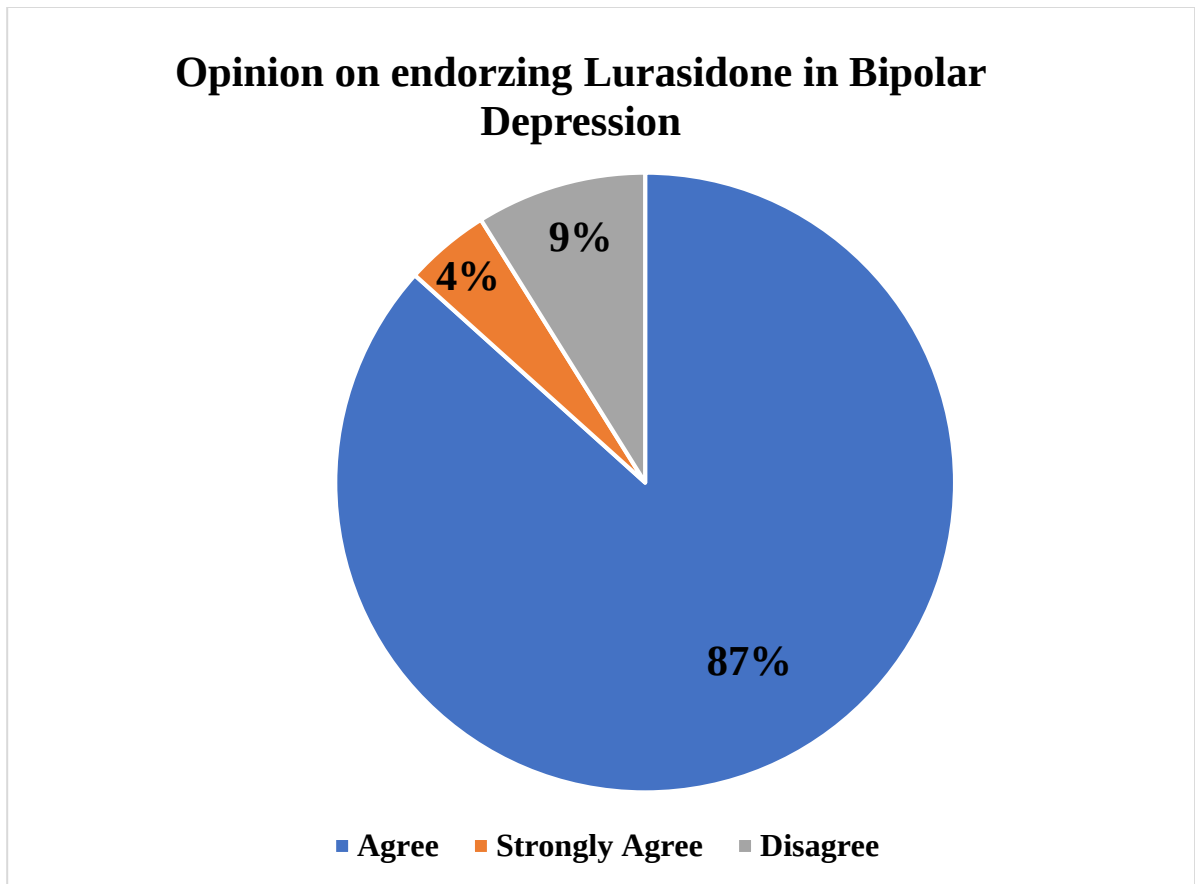


Then, further doctors were asked another question for prescription of the drug was that what were the various concerns that limit the doctors' prescription for lurasidone for the various patients of the Psychotic disorders and variety of opinion of the doctors were obtained and recorded and doctors wanted to tick the multiple opinion from the five options in the questionnaire and which created a new category that consists both side-effects and efficacy, the main reason to create the new category was as there were some of the doctors who were only affected by only one of the category out of the four. From the above graph, the side-effects

category holds almost half of the pie-chart, it was found to be about 45% of the total area and the second most category by which the doctors were affected by the efficacy of the drug since Lurasidone is effective drug doctors were prescribing that drug but also at the same time searching for the more efficacious one and coming on to the third segment in the graph was the “Both segment” holds for 24% and this category holds for those doctors whose prescription was affected both by the side effects and efficacy however very few doctors were affected by dose titration.

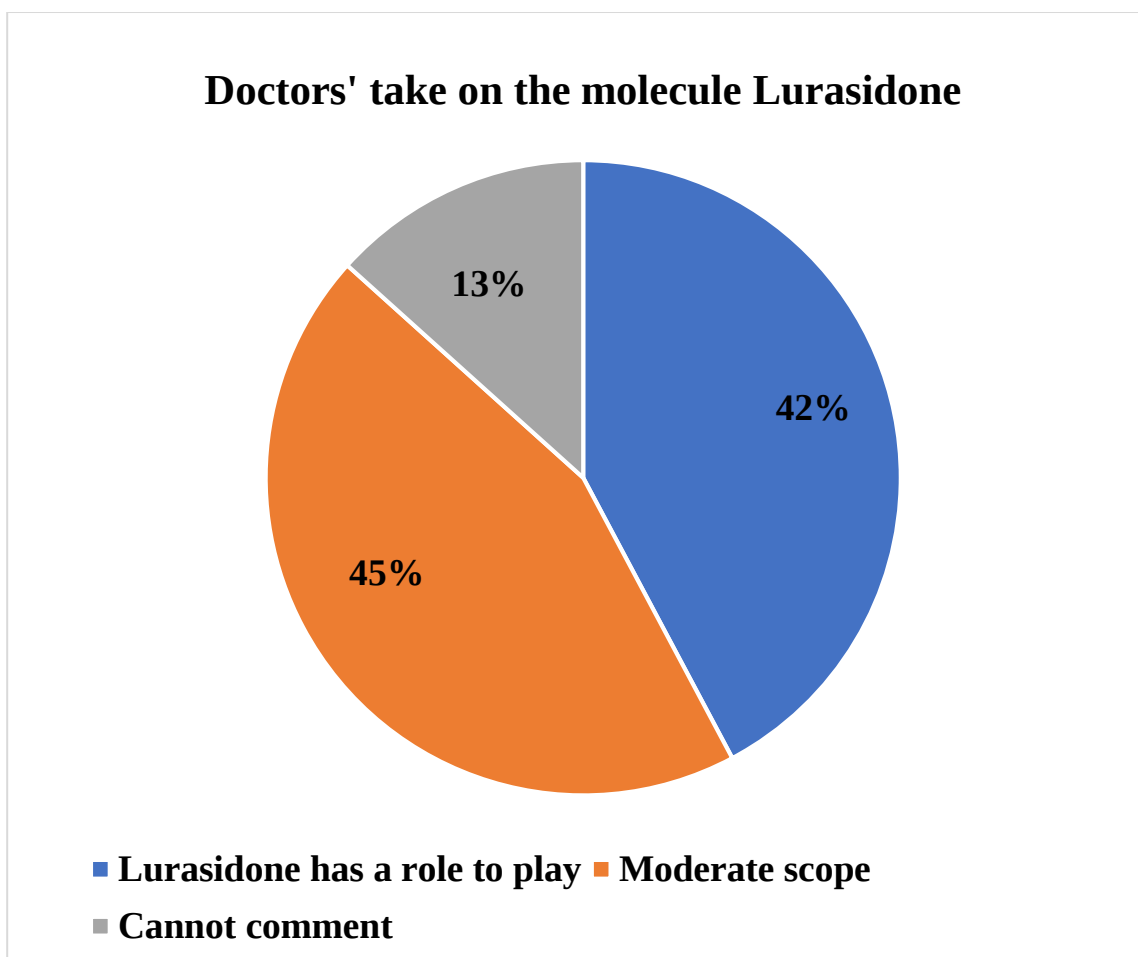


After all those responses from the doctors, another questions for the results of the responses they were getting from lurasidone were recorded and from the results it was found that 84% of the doctors were getting moderate to good response from the lurasidone drug and all the symptoms are generally treated but still the doctors prescribe lurasidone along with the other combinations to give symptomatic treatment to the patients however 9% of the doctors told that they had poor response from the lurasidone from the lower doses of the drug as it seems only to be the initial or the starting dose after which it do not pose such effect in the patients suffering from schizophrenia or Bipolar depression and 7% of the doctors had excellent response from this drug.



After getting all those responses from the doctors they were asked their opinion on endorsing Lurasidone in Bipolar Depression as no. of scientific articles strongly endorse Lurasidone for Bipolar depression so what's their opinion on that so after talking to all those doctors and obtaining their views it was found that 87% of the doctors were very well agreed to this fact and recommend endorsing Lurasidone for Bipolar depression and still find lurasidone as an effective drug for the treatment of bipolar depression and 4% of the Doctors strongly recommend it for the same and getting very good results and were also very happy with the performance whereas 9% of the doctors were not agreed to this fact as they said that day by day in the market new drugs were coming and they were still in search of even good drug than Lurasidone and also they hadn't got that good results in

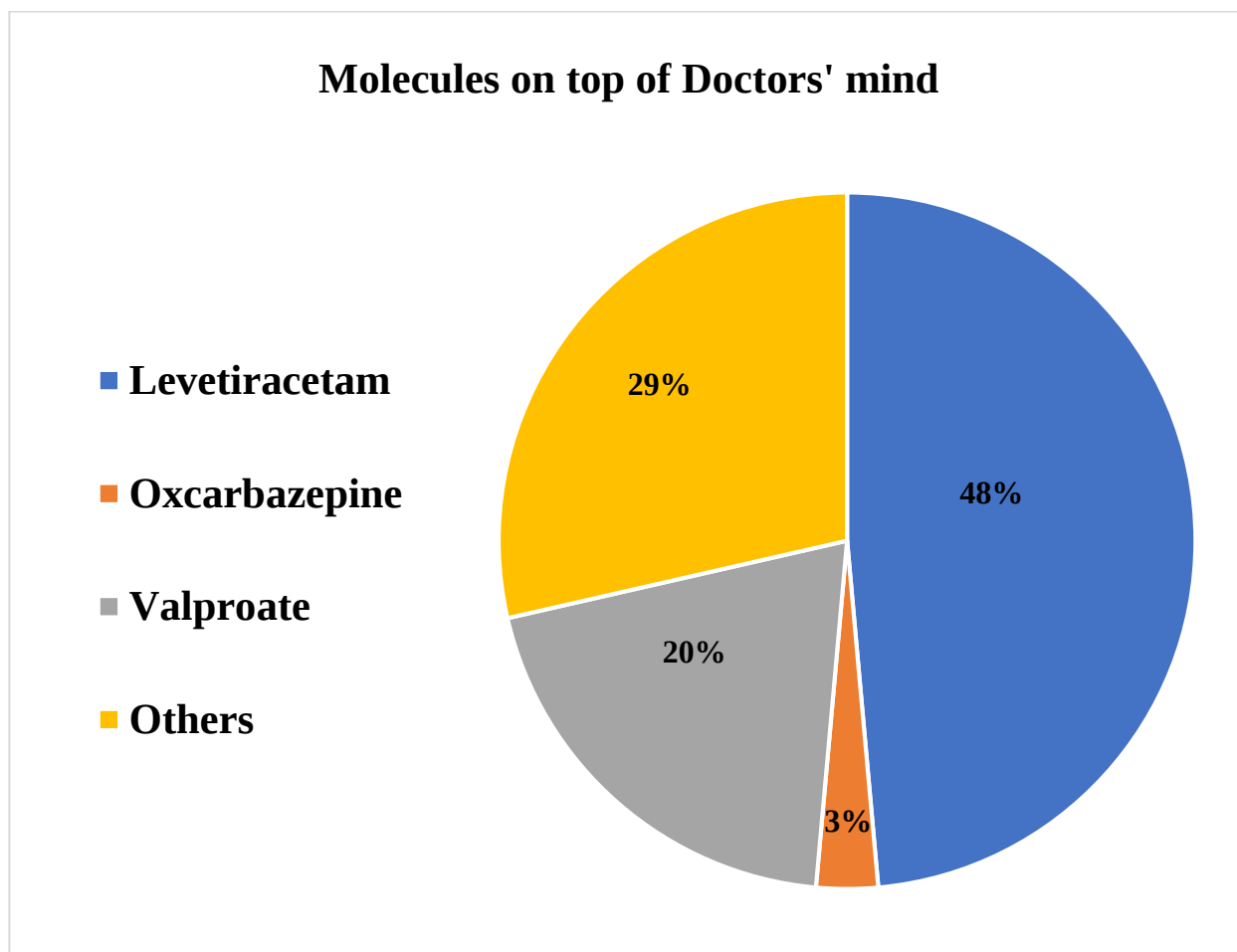
patients so they denied the fact but if seen combinedly 91% doctors were in the favor of endorsing Lurasidone in Bipolar depression.



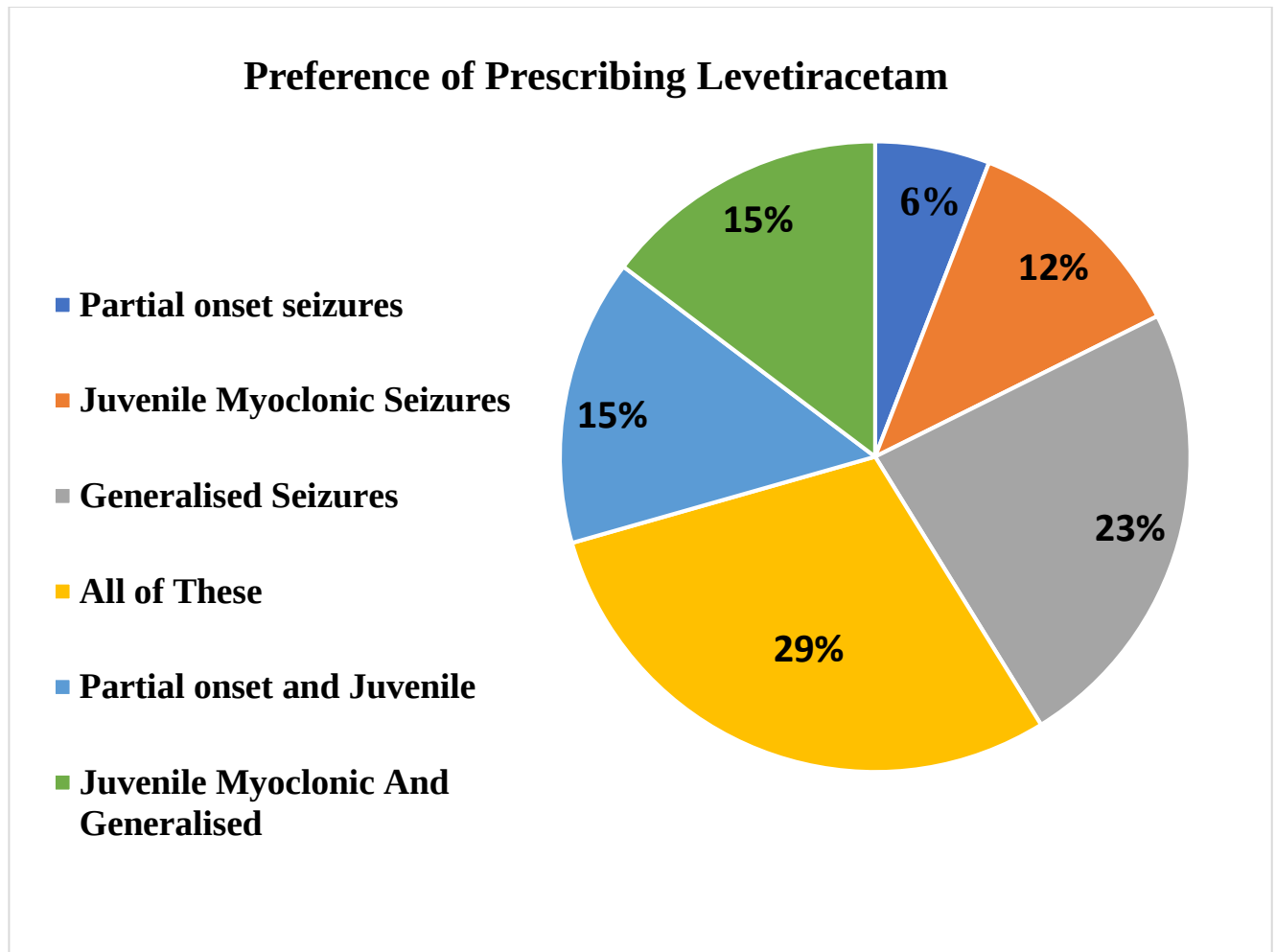
Heading towards the last question of the questionnaire, doctors were asked that what's their overall opinion on the drug Lurasidone and was the total reaction and response about this drug from the three options given in the questionnaire. The responses recorded from the data obtained and above graph was made. The major portions in the graph run almost the same i.e. 45% and 42% and another response recorded were 13% that holds the minor portion in graph. 45% of the doctors suggested that Lurasidone overall has moderate scope whereas as 42% of the doctors said that Lurasidone is going very well in the sector of Anti-Psychotics

and Hence playing a good role, however 13% of the doctors hadn't commented on this question and the main reason for this they are still in the wait of new molecule for the better action and responses.

**ANALYSIS OF LEVETIRACETAM DRUG.** For the analysis of Levetiracetam drug, a Structured questionnaire was prepared consisting of various questions which were asked by the doctors to collect their valuable opinion. Several types of questions were asked from the structured questionnaire and their responses were recorded. Pie-charts were made accordingly from those responses and discussions were made on them.

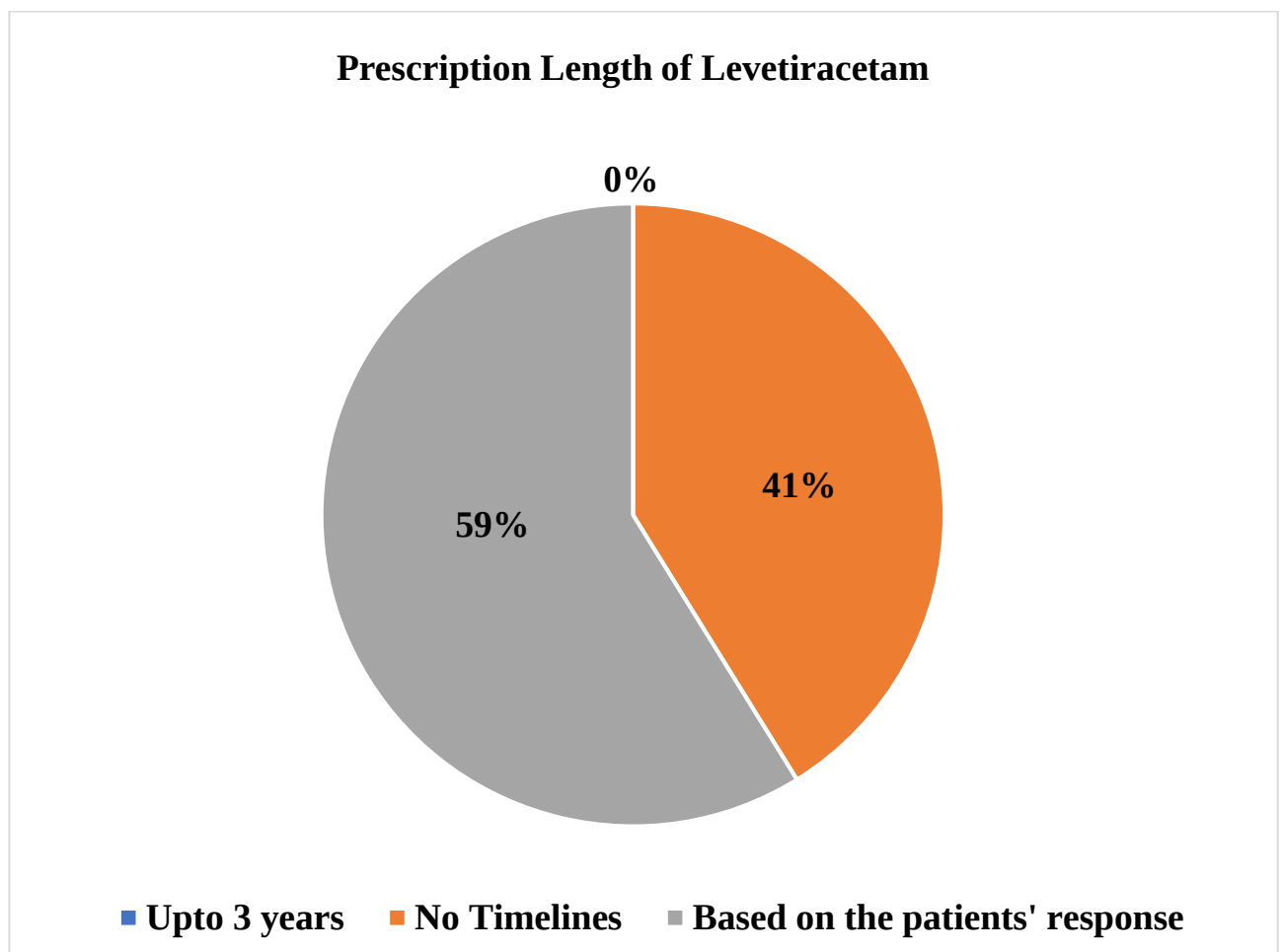


The Discussion of the Levetiracetam drug began with the doctor with the very first question to know the opinion of the doctors that what were the various molecules that came in their mind whenever a patient of Epilepsy come in front of them from some of the options developed in Structured questionnaire and on the collection of the data good response was obtained for the levetiracetam drug about 48% of the doctors undoubtedly marked levetiracetam as they are getting good response from the drug then why not to mention the drug name in their good list and hence they were recommending levetiracetam as the treatment of epilepsy, the second large segment i.e. 29% that covers the second major portion in the graph was the “others” segment which included many other drug names that were quoted by the doctors during the collection of the data, some of the names of such drugs include Lamotrigine, Phenytoin, Carbamazepine, Topiramate and many others, some of the doctors also named Valproate which accounted for about 20% in the graph area and last but not the least, came the oxcarbazepine which accounted for very few percent only for 3% of the total.



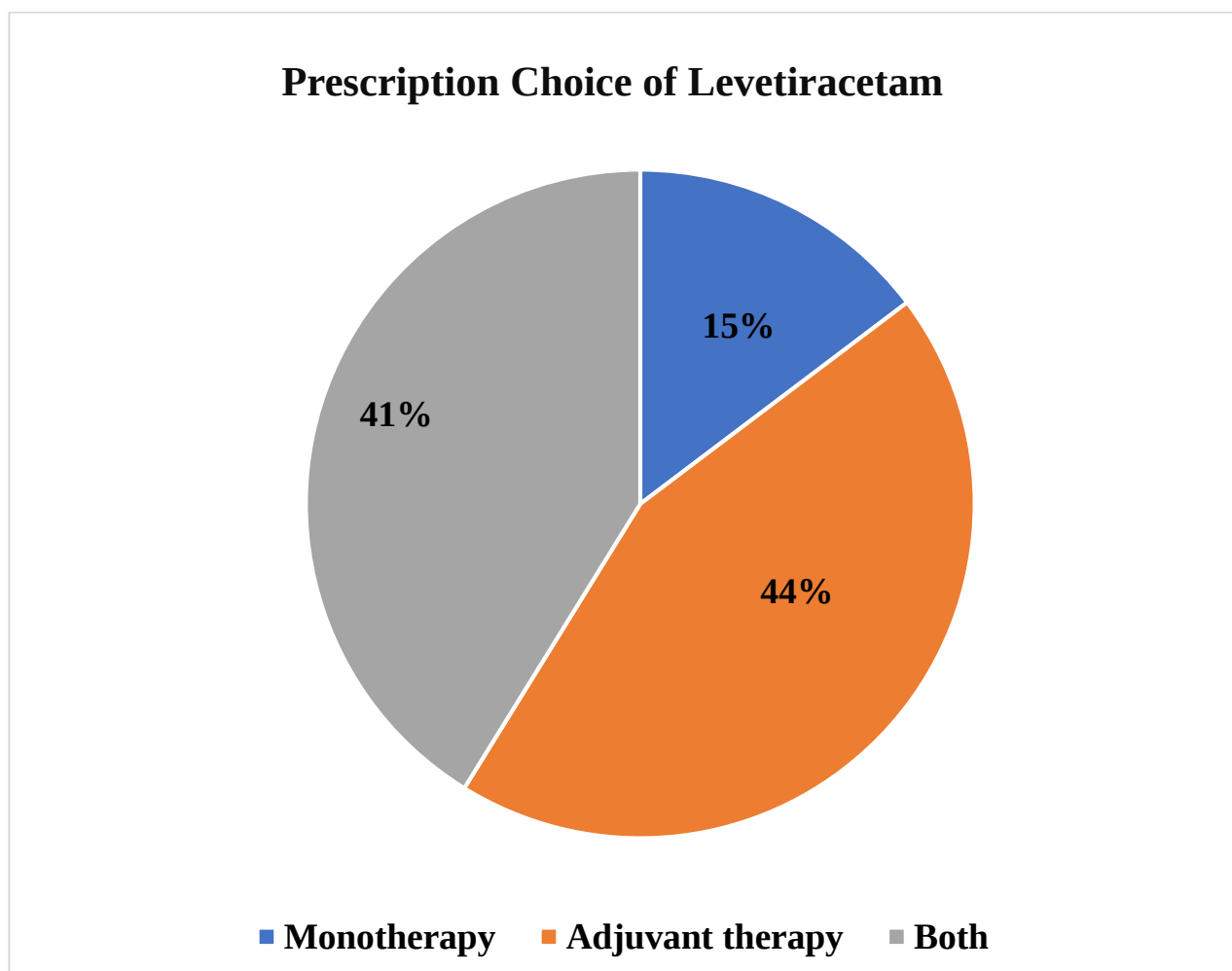
After asking the question on what molecule come in their mind the first after diagnosing an Epileptic patient, Doctors were asked about their preference of prescribing the levetiracetam in which preferred indication in which they prescribe drug the most and again multiple responses from the doctors were obtained that led to the creation of new categories apart from that there were already available in the questionnaire. From the data it was found that most of the doctors prescribe lurasidone in all of the symptoms such as Partial onset seizures, Juvenile Myoclonic Seizures, Generalized Seizures and however 23% of the doctors were prescribing this drug only when they found a patient with generalized seizures whereas there were doctors who only prescribe lurasidone in only one or two symptoms such as 6% of the doctors prescribe levetiracetam in

Partial onset seizure and for Juvenile Myoclonic seizures 12 % of the doctors prescribe levetiracetam drug for such patients. Then there came the multiples in which doctors prescribe in the two of the symptoms from four mentioned in the questionnaire 15% of the doctors' choice of prescription for levetiracetam were in Partial onset and Juvenile myoclonic seizures and 15% of the doctors that prescribe in juvenile myoclonic and generalized type of seizures.

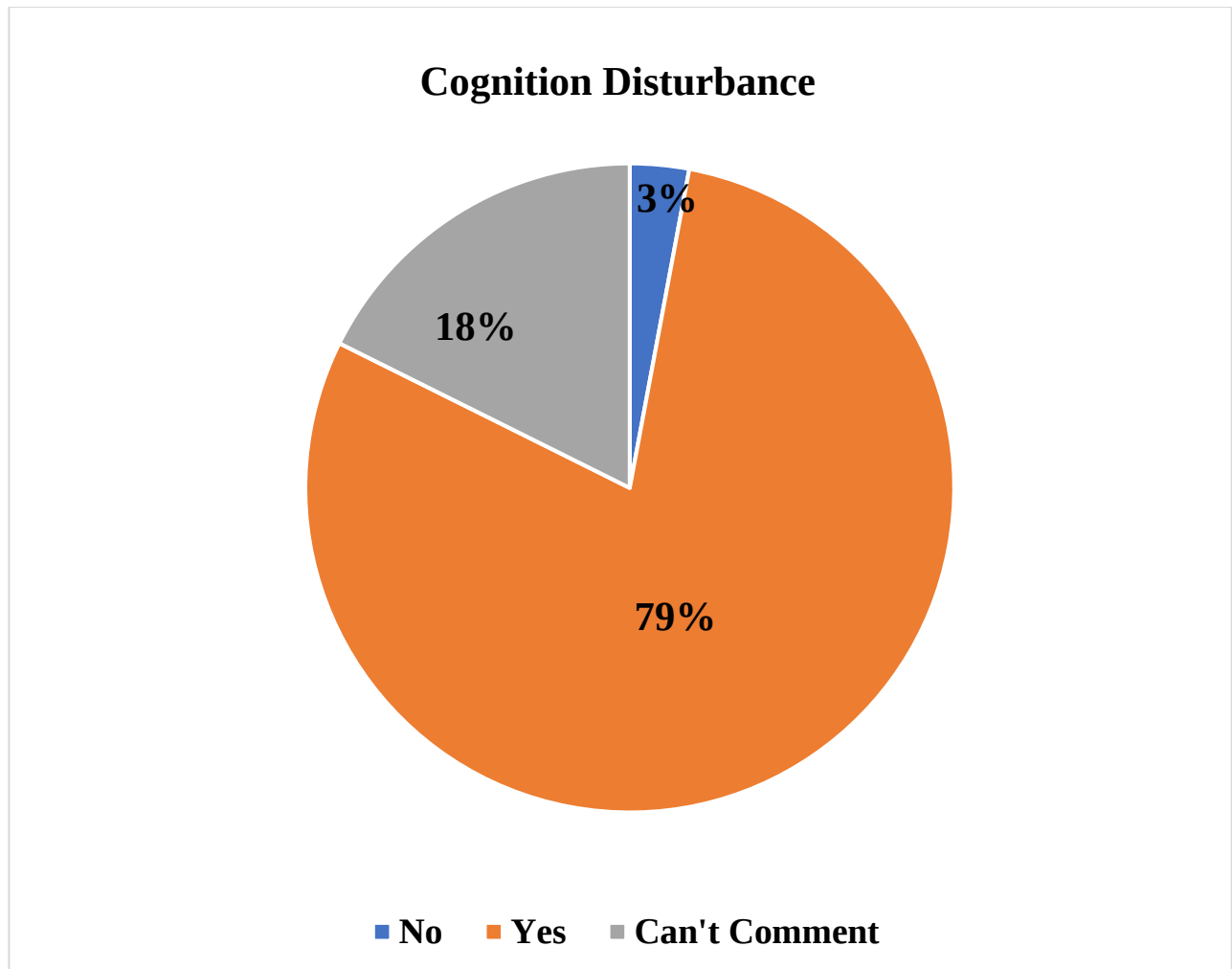


After asking the question that in which type of epilepsy do the doctors prescribe the levetiracetam, doctors were asked about the length of the prescription of the levetiracetam for the epileptic patients and most of the doctors said that it was not

as confined that there were some specific limit about 41% of the doctors said that there were no timelines for the prescription of a particular it depends upon the treatment of the symptoms which were occurring in the patient, and it was also true that if they had seen that the drug was not that much effective and the symptoms of the patients were not getting affected by the drug they may change the dose regimen or may even change the drug too however 59% of the doctors said that it was truly based upon the patient's response that how much time would the patient take to get cure and all the symptoms do not reoccur or completely get cured by it.

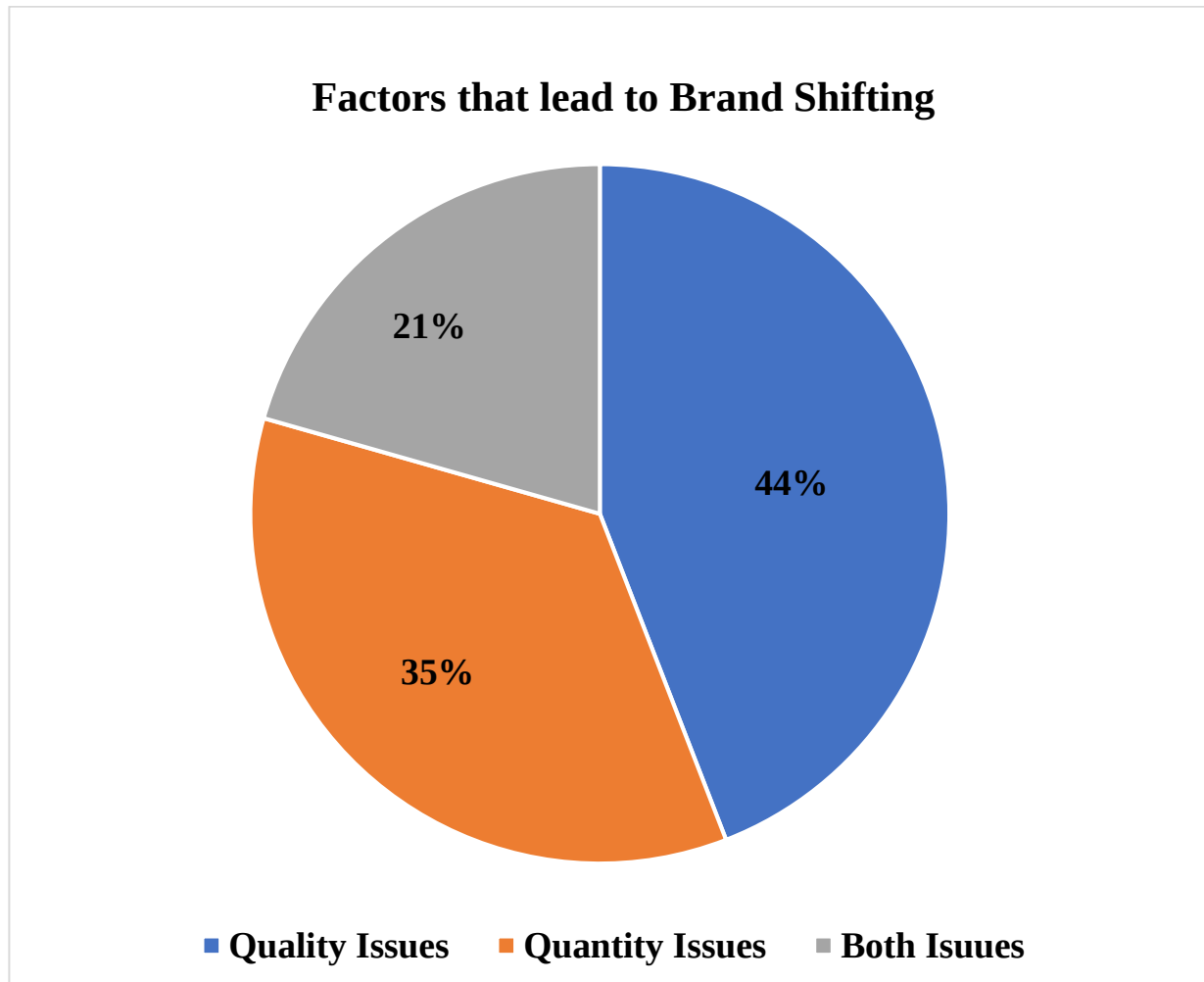


Just as in Bipolar depression doctors were asked about their prescription choice for prescribing the lurasidone as in Monotherapy or in combination of the drugs just same in the case for the Epileptic patients for the drug Levetiracetam doctors were asked about their choice of prescription and very few doctors told that they go for monotherapy mostly with the higher doses of levetiracetam drug whereas the two major portions covering the greater area that were 44% and 41% they were 44% of the doctors said that they go for adjuvant therapy that means along with the levetiracetam they also prescribe some of the other drugs so as to cure the other side symptoms that were occurring along with the main disease or disorder and 41% of the doctors go for “BOTH” i.e. they prescribe levetiracetam along with the other drugs also support monotherapy in some of the patients to whom they give higher doses of levetiracetam. Generally, the doctors who were giving the drug in combination told that they take levetiracetam of low dose and appropriate doses of other drugs were taken to give more effective treatment and to shorten the period of recovery.



Along with all those questions doctors were asked that have they seen any cognition disturbance among the patients who were on the monotherapy of levetiracetam drug and they have seen the cognitive symptoms reoccurring and were not getting cured, cognitive symptoms like sensation, ability to speak, memory, recalling people, difficulty in day to day work like that and after recording the data it was found that most of the doctors about 79% of the doctors said yes they met with such problems but that was not a very big issue this was the reason they were prescribing the drugs in the combination so as to counter act the side symptoms that is why most of the doctors prefer prescribing in combination however only 3% of the doctors hadn't reported any of such problems and 18% of the doctors haven't commented on the question that they

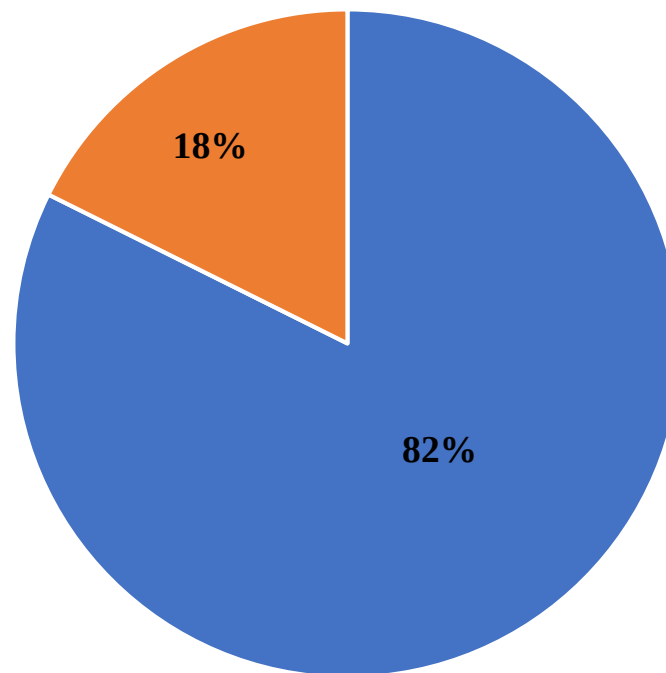
have found cognition disturbance or not they said they have yet not analyzed that the symptoms were due to the drug or not as they were also prescribing the drug in the combination and the following symptoms get treated and they haven't faced a big problem due to that.



Although many of the doctors were prescribing the desired drug but still doctors were asked that in which cases they prefer brand shifting that how often doctors shift to another brand or to another drug after recording the data and the results obtained from that were 44% of the doctors were affected by the quality issues of

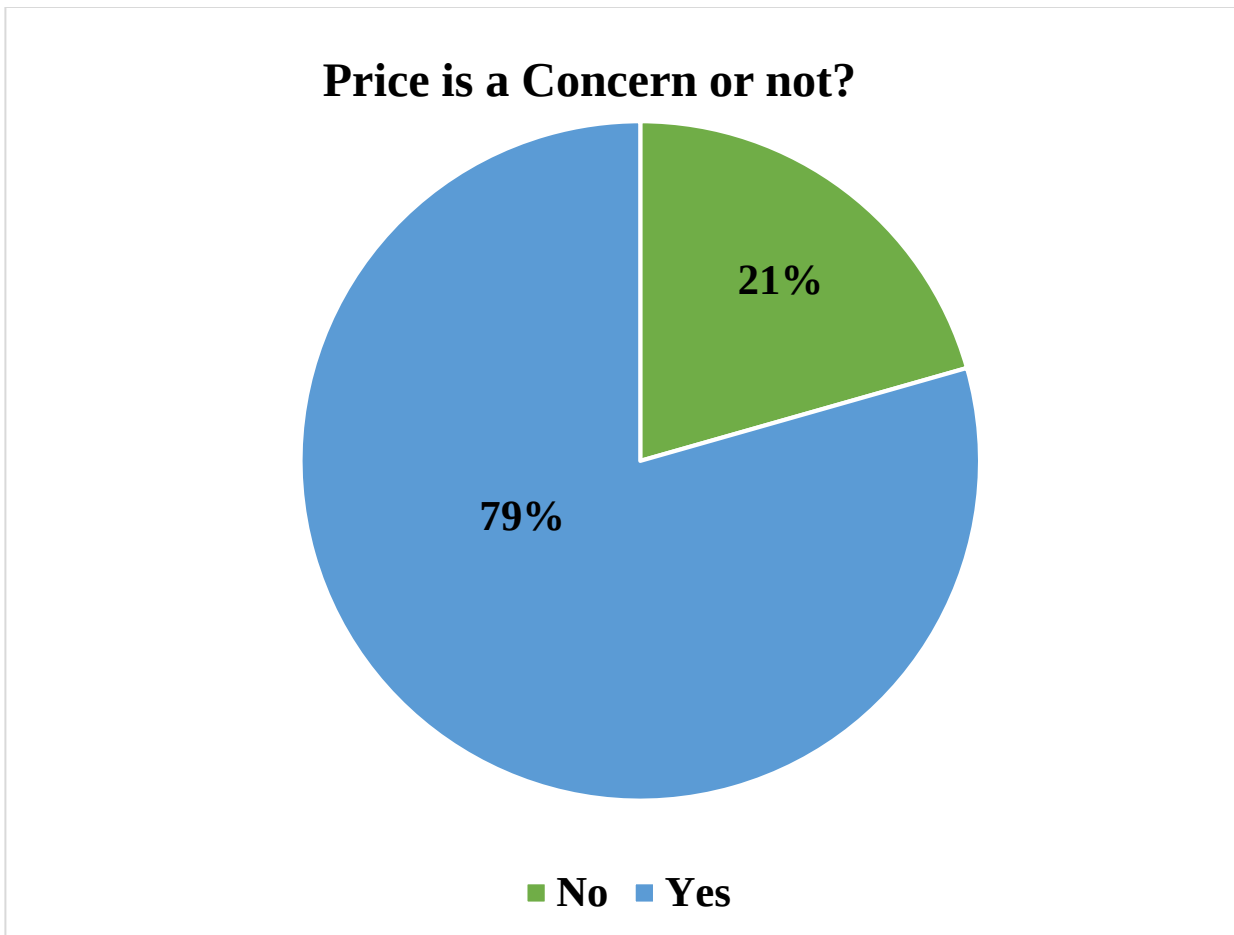
the drug i.e. how efficacious was the drug in treating the desired symptoms of the patients and what are the various excipients used in their drug whereas 35% of the doctors were affected by the quantity issues i.e. different types of the dosage forms and dose of the drug available for the patients however 21% of the doctors were that they were affected both by the quality issues as well as the quantity issues so it's a mere suggestion to resolve both the factors to upgrade their drug in doctors knowledge.

**Continue to prescribe Levetiracetam if Brand is Changed**

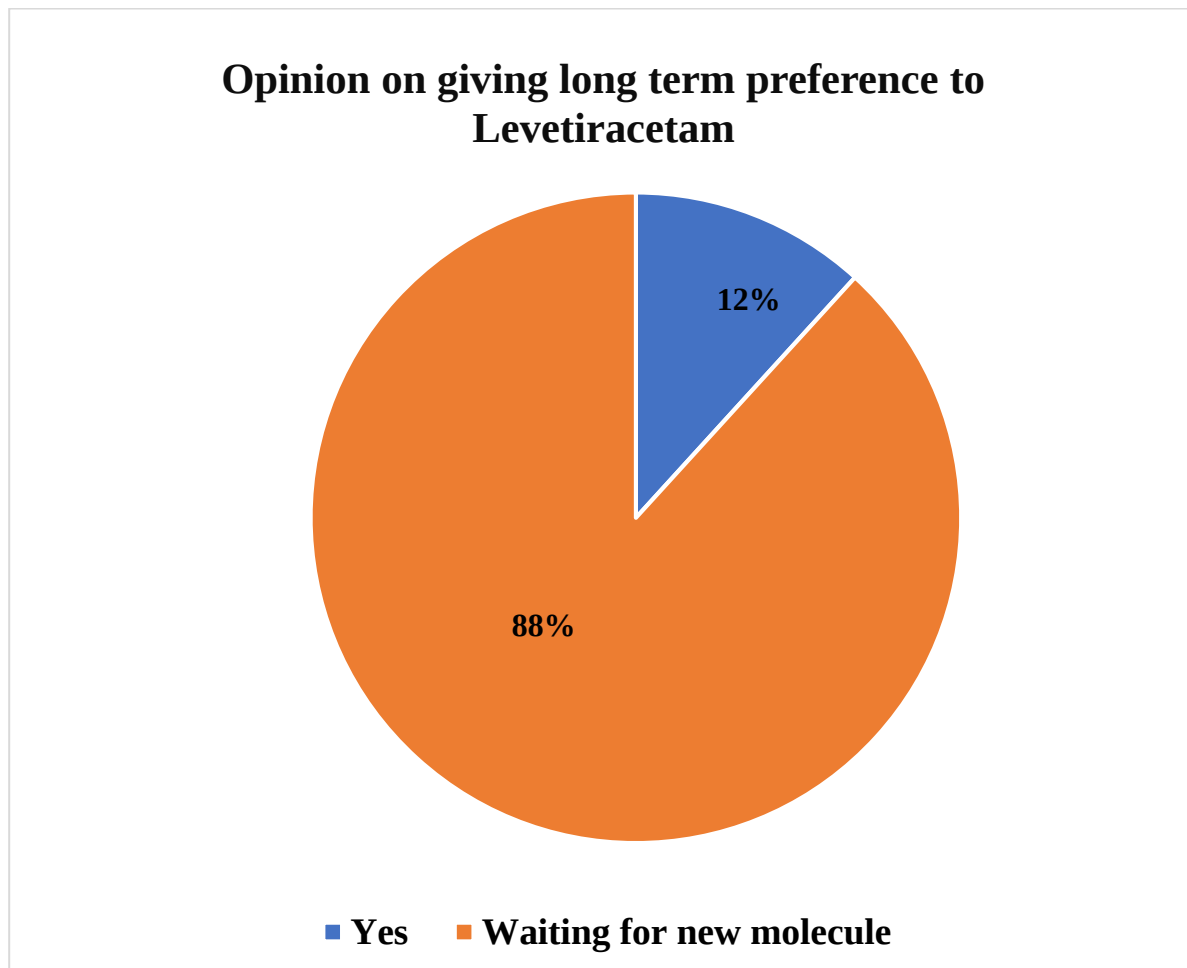


■ Yes, will Continue    ■ Think over Decision

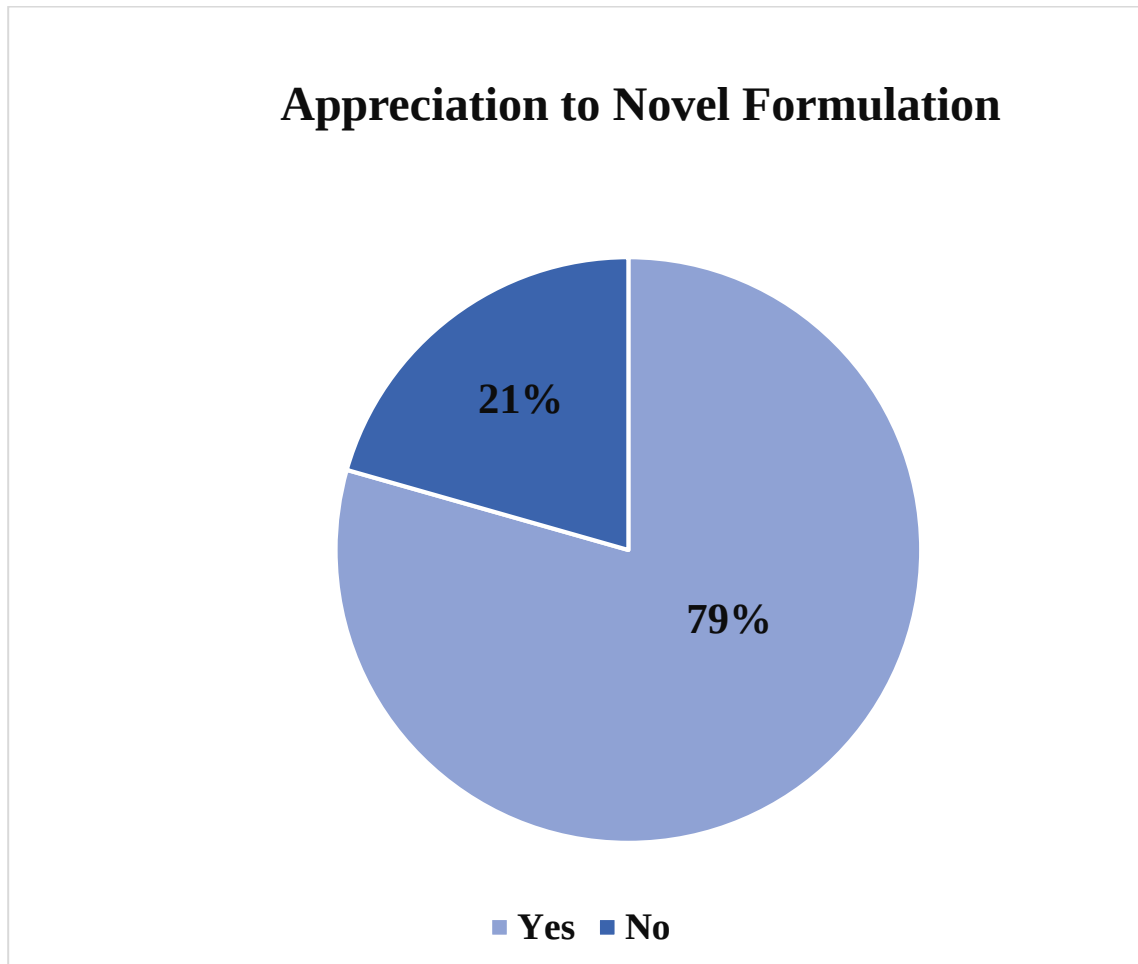
After knowing the factors by which doctors' prescription gets affected either with the quality issues or with the quantity issues or with the both. Doctors were again asked as if they will stick to the drug if the brand gets changed the main motive behind this question was to see that whether the doctor was loyal to the brand or the drug hence after the collection of the data when a pie-chart of the following data was made it was found that 82% of the doctors said that they will continue to prescribe the drug as if the brand will even change as they were affected by quality issues and the quantity issues but not by the brand and if they will be getting the same quality and quantity they would continue prescribing the drug however 18% of the doctors said that they would have a decision later on and decide what to do but their first preference would be to treat the patient effectively.



Since money always play its role in increasing or decreasing the market of the drug so it was also thought to take what was doctors opinion on that so the doctors were asked that price would be a factor for them for choosing levetiracetam or not and after the collection of the data it was found that 79% the doctors said that price is not a factor for them and they would be prescribing the drug as the drug was effective hence they would keep on prescribing the drug so as to cure the patients. However, 21% of the doctors said that they were affected by the cost of the drugs as all the type of patients come to them and along with the effectiveness they also see the economic status of the patient. Overall, effectiveness comes the first and price the second.



Coming on to the second last question the doctors were asked about their opinion on giving long term preference to levetiracetam drug and mostly it was found that doctors are continuously seeking more effective drugs in the market even then that of levetiracetam drug and about 88% the doctors said they are still waiting for a new molecule and 12% of the doctors said that it's a Yes from there side that they can think of levetiracetam for the long-term prescription drug in the dosage regimen.



The last question asked from the doctors for the survey of levetiracetam drug from the structured questionnaire was that would they appreciate any novel formulation of levetiracetam drug to this doctor enquired that doctors are already searching for the novel formulations of good and effective drugs. Since, levetiracetam was in the good list of the doctors for the anti-epileptic patients so, they would like to see novel formulation of levetiracetam drug. Hence 79% of the doctors said yes to this question however the doctors who had little bit questionable experience with the drug and had queries denied the fact.

## **MAJOR FINDINGS:**

### **For Lurasidone:**

- 49%-38% of the doctors had Good to moderate response from the Lurasidone and were quite happy and willingly prescribing the drug to the schizophrenic patients and patients with Bipolar depression.
- 64% of the doctors were prescribing in the BOTH segment i.e. Schizophrenia and Bipolar depression and others in the either category.
- 69% of the doctors were prescribing Lurasidone in the dose segment of 40mg – 80mg in the case of schizophrenic patients.
- 60% of the doctors were prescribing Lurasidone in the dose segment of 40mg – 80 mg in the case of Bipolar Depression.
- 71% of the doctors were prescribing lurasidone in Combination along with the other anti- psychotics in Schizophrenia.
- 76% of the doctors were prescribing lurasidone in combination along with the other anti- psychotics in Bipolar Depression.
- 45% and 24% of the doctors were affected by the side effects and both (Side effects and efficacy) that limits the doctor's prescription from lurasidone.
- 84% of the doctors were getting moderate response in the case of schizophrenia.
- 87% of the doctors agrees to the fact that they can think of endorsing lurasidone in Bipolar depression.
- 45% of the doctors said that lurasidone had moderate scope.

## For Levetiracetam:

- 48% of the doctors firstly think of Levetiracetam drug for the treatment of Anti-epileptic patients.
- 29% of the doctors prescribe levetiracetam in all the symptoms of epilepsy.
- 59% of doctors' prescription length of the drug depends upon the patients' response.
- 44% of the doctors' prescription choice was as adjuvant therapy and 41% of the doctors prefer it as both Monotherapy and Adjuvant therapy.
- 79% of the doctors still facing cognition disturbances along with levetiracetam monotherapy treatment.
- Brand shifting for doctors matters as if there were Quality, Quantity issues or both. Doctors rely upon them as 44% on Quality, 35% on quantity and 21% as both (Quality and Quantity).
- 82% of the doctors said that they would keep on prescribing levetiracetam if the brand may change provides the Quality and efficacy remains the same.
- To 79% of the Doctors price was a factor of concern for levetiracetam.
- 12% doctors were ready to agree that levetiracetam will be most preferred in Anti-epileptics whereas 88% doctors were still in wait for new molecules better than Levetiracetam.
- 79% of the doctors were appreciating levetiracetam drug for its novel formulations in the market.

## **CONCLUSION:**

Lurasidone and Levetiracetam both were doing very well in the market and were even appreciated by the doctors at every point. Hence, the drug was making self-position in the market higher than that of other drugs. When compared to others, both the drugs i.e. Lurasidone and Levetiracetam were performing great and during the survey it was observed that no doctor was there who was unaware of the drugs every Neuro physicians\ surgeons and Psychiatrist heard of Levetiracetam and Lurasidone respectively. The sales of both the drugs can be increased to further extent by making some changes that would be shared in recommendations. In the case of Lurasidone, emphasis should be laid on the doses segment and doctors should be visited and taken their queries. Still 7% of the doctors said they hadn't tried lurasidone hence they should be asked for queries. Scrutiny should be paid why doctors were getting problem with the prescription of 80mg dose both in Schizophrenia (2%) and Bipolar depression (4%). 45% of the doctors said that side effects still limit their prescription. 9% of the doctors were still getting poor responses in schizophrenia that need to be resolved. 9% of the doctors were still disagreeing with the fact of endorsing Lurasidone in Bipolar Depression. In case of Levetiracetam, still 79% of the doctors were saying that they get cognition symptoms from monotherapy of Levetiracetam. 21% of doctors still not seeing forward novel formulation of Levetiracetam. So, all these measures need to be taken down to obtain the best results out of it.

## **RECOMMENDATIONS:**

### **For Lurasidone:**

- Need to create awareness among the doctors about the drug so that their queries should be resolved and they can easily recommend the drug.
- More Emphasis should be paid on the 80mg drug dose as very few doctors are prescribing in Schizophrenia (2%) and Bipolar depression (4%).
- Doctors should be asked about the side effects and efficacy issues, if persisting.
- Doctors should be asked about their issues for not endorsing lurasidone in Bipolar Depression.
- Brand equity should be increased.
- Drugs along with company names printed on promotional articles\items such as clocks, Table calendars, Pens, Planners.

### **For Levetiracetam**

- More emphasis should be laid on price segment of the drug.
- As 88% of the doctors are waiting for the new molecules discussion along with them should be made to improve levetiracetam.
- Discussion along with the doctors should be made to counter the cognition disturbances coming from levetiracetam.

