

MARKET GROWTH EVALUATION AND COMPARISON OF DRUGS FOR INFERTILITY IN MEN AND WOMEN

Dissertation Submitted to



IIHMR University, Jaipur

for the partial fulfillment for the award of the
degree of Master of Business Administration

(MBA)

in

Pharmaceutical Management

by

Jasneet Kaur
0243

Under the Supervision and Guidance of

Dr. Surya Prakash,
Associate Professor, School of Pharmaceutical Management,
IIHMR University, Jaipur

2022

MARKET GROWTH EVALUATION AND COMPARISON OF DRUGS FOR INFERTILITY IN MEN AND WOMEN

Dissertation Submitted to



IIHMR University, Jaipur

for the partial fulfillment for the award of the
degree of Master of Business Administration

(MBA)

in

Pharmaceutical Management

by

Jasneet Kaur
0243

Under the Supervision and Guidance of

Dr. Surya Prakash,
Associate Professor, School of Pharmaceutical Management,
IIHMR University, Jaipur

2022

DECLARATION BY STUDENT

I hereby declare that this dissertation titled **Market growth evaluation and comparison of drugs for infertility in men and women** is the Bonafede record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

(Signature)

Jasneet Kaur

Date

CERTIFICATE

This is to certify that Jasneet Kaur in partial fulfillment of the requirements for the award of the degree of MBA (Pharmaceutical Management from the IIHMR University, Jaipur has successfully completed her internship at Bryson Pharmaceutical LLP during March 22, 2022, to June 19, 2022.

Place:

Ashish Goswami

Date:

Director

Bryson Pharmaceutical

CERTIFICATE

This is to certify that dissertation titled **Market growth evaluation and comparison of drugs for infertility in men and women** is a record of the research work undertaken by Jasneet Kaur in partial fulfillment of the requirements for the award of the degree of MBA (Pharmaceutical Management) from the IIHMR University, Jaipur under my guidance and supervision and his approach to the research study has been sincere, scientific, and analytical.

Dr. Surya Prakash
Associate Professor
IIHMR University, Jaipur

Date

Dr, Saurabh Banerjee
Dean, SPM
IIHMR University, Jaipur

Date

Acknowledgments

First, I would like to thank God Almighty for everything I am blessed with and would thank the participants within the study for their time and effort in completing the questionnaires.

During my dissertation work, I got advice, suggestions and co-operation from many people which have influenced, inspired, and helped me in completing this project. A task becomes easier when you get the moral support and encouragement, and if these names are not listed, the project work and the thesis would remain incomplete.

Firstly, I would like to convey my honest unforgettable regardful thanks and gratitude to Respected Dr Surya Prakash, Associate Professor in Pharmaceutical Management, IIHMR, Jaipur, Rajasthan, who from his busy schedule had spent his valuable time to motivate me at various levels and put me on right path to complete my project properly. Without his able assistance, my project would not have been completed authentically. I extend my sincere gratitude towards him. And wish to receive the same in future as well.

Also, I thank Mr. Ashish Goswami, Director, Bryson Pharmaceutical LLP for his valuable support and constant guidance throughout my project.

I express my sincere gratitude to Resp. Dr. P.R Sodani, President, IIHMR University and Resp. Dr. S.D Gupta, Chairman, IIHMR for providing a stand up for rising and enhancing the study skills.

Last, but not the least, I am highly thankful for the support & blessings received from other teachers and friends, who have directly or indirectly put forward their ideas and suggestions & have encouraged me throughout the compilation of this project.

JASNEET KAUR

MBA PM12

0243

Table of Contents

LIST OF FIGURES	8
LIST OF TABLES	8
LIST OF GRAPHS	8
Chapter 1 – Introduction	1
Chapter 2 – Review of Literature	8
Chapter 3 – Methodology	10
Chapter 4 – Data Analysis and Findings	11
Chapter 5 – Results and Discussion	21
LIMITATIONS OF STUDY	23
FUTURE DIRECTIONS	23
References	24
APPENDIX 1	26

LIST OF FIGURES

FIGURE 1.1	Causes of infertility data
FIGURE 1.2	Causes of infertility

LIST OF TABLES

Table 4.1	Composition of infertility drugs
Table 4.2	Role of ingredients in female infertility
Table 4.3	Role of ingredients in male infertility
Table 4.4	Market study of top brands of drugs for female infertility
Table 4.5	Market study of top brands of drugs for Male infertility
Table 4.6	Brand composition comparison of drugs for female infertility
Table 4.7	Brand composition comparison of drugs for male infertility

LIST OF GRAPHS

Graph 4.1	Market growth study of infertility drugs
-----------	--

Chapter 1 – Introduction

Infertility is a worldwide wellbeing issue influencing millions of individuals of regenerative age around the world. Accessible information proposes that between 48 million couples and 186 million individuals have fruitlessness all inclusive. Barrenness may be a malady of the male or female regenerative framework characterized by the disappointment to attain a pregnancy after 12 months or more of normal unprotected sexual intercourse. Essential (Primary) barrenness is the failure to have any pregnancy, whereas auxiliary (Secondary) barrenness is the failure to have a pregnancy after already fruitful conception. WHO's Universal Classification of Infections gives more data on the numerous essential and auxiliary causes of fruitlessness in both ladies and men. Infertility may happen due to male variables, female variables, a combination of male and female variables or may be unexplained. For both ladies and men, be that as it may, natural and way of life components such as smoking, intemperate liquor admissions, weight and introduction to natural toxins have been associated with lower fertility rates.

The infertility drugs market size is expected to increase significantly owing to the increase in research and development studies for more effective treatment to achieve pregnancy and live birth.

Moreover, the increasing prevalence of lifestyle disorders and unhealthy diets such as obesity, stress, smoking, diabetes, polycystic ovary syndrome (PCOS) etc. it also leads to infertility, ultimately increasing the demand for infertility medications.

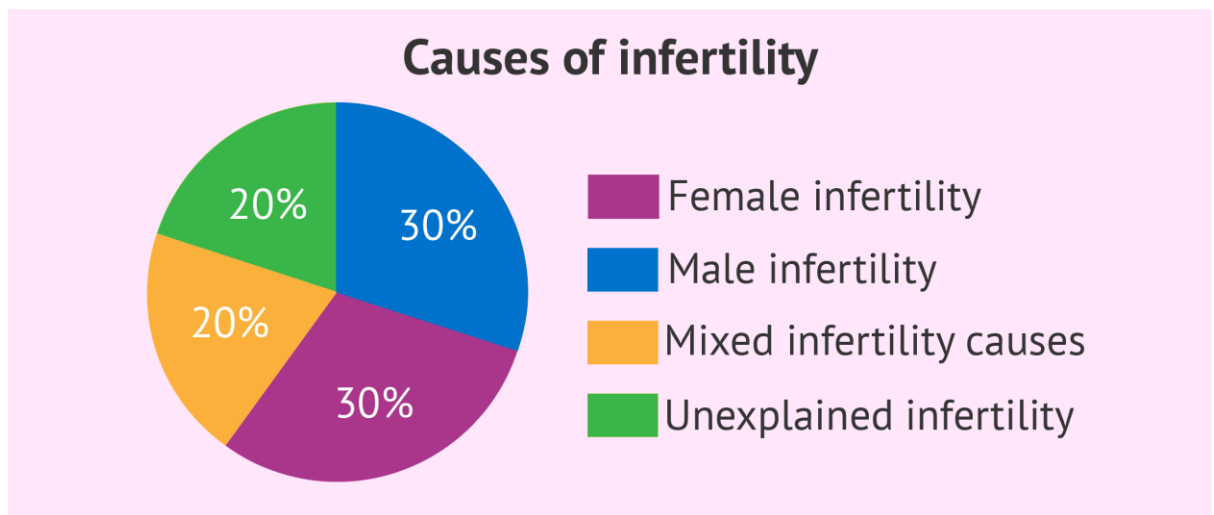


Figure 1.1 – Causes of infertility data (Source: <https://www.invitra.com/en/sterility-causes/causes-of-sterility/>)

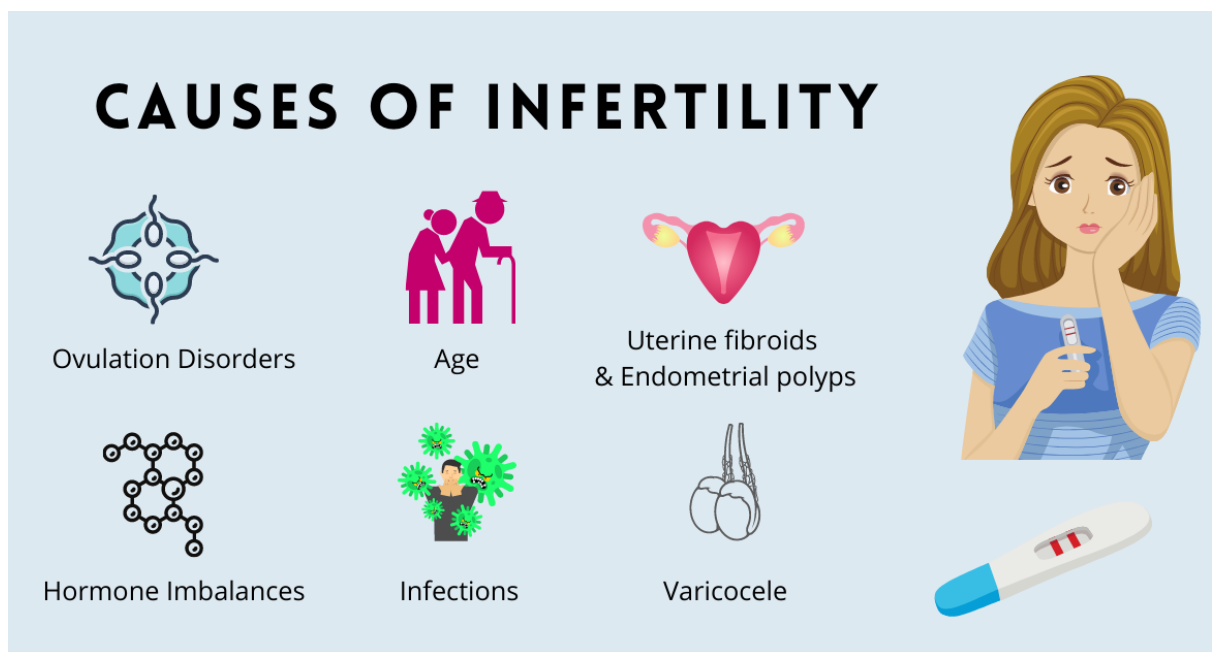


Figure 1.2: Causes of infertility (Source: <https://www.sriramakrishnahospital.com/most-common-causes-of-infertility/>)

Causes of infertility in men

1. Semen and sperm

Semen is the milky liquid that a man releases during an orgasm. Semen is made up of liquid and sperm. Fluid comes from the prostate, seminal vesicles, and other gonads. Sperm forms in the testicles. When a man ejaculates and releases sperm through the penis, the semen, or sperm, helps transport the sperm to the egg.

The following problems may occur:

- *Low sperm count*: Men ejaculate with low sperm counts. If the count of sperm is less than 15 million, it is considered low. About one third of couples have issues in conceiving because of a less sperm count.
- *Low sperm motility*: It means that sperms are not able to move as fast as they need to.
- *Abnormal sperm*: The sperm might have an abnormal configuration, thus, making it difficult for the egg to move or fertilize. Conception can be difficult if it is in the correct shape or cannot move quickly and accurately toward the egg.
- *Sperms quality*: Some men experience lower than optimal sperm quality, which may be due to factors such as environmental exposure or lifestyle choices. However, up to 2 percent of men can have this problem.
- *Abnormal semen*: Abnormal semen does not bear the sperm efficiently. This can be a consequence of:
 - A medical condition: This can be an infection of testicles, cancer, or surgery.
 - Overheated testicles: The causes may involve an undescended testicle, a varicocele, or varicose vein in the scrotum, the use of saunas or hot tubs, wearing tight clothes, and working in hot environments.
 - Ejaculation disorders: If the ducts for ejaculation are blocked, semen might ejaculate into the bladder.
 - Hormonal imbalance: For example, hypogonadism can lead to a lack of testosterone.

Other factors may involve:

2. Genetic factors: Men should have an X and Y chromosome because these chromosomes determine a person's sex. If he has two X chromosomes and one Y chromosome, as in Klinefelter syndrome, the testicles of men with this syndrome develop abnormally and these men have low testosterone and low sperm count or no sperm.
3. Mumps: Mumps can lead to the testicles being inflamed, which can hamper production of sperms.

4. Hypospadias: The urethral meatus is below the penis, not at its tip. This abnormality is usually corrected surgically during infancy. If the correction is not made, it may be more difficult for sperm to enter the woman's cervix. There is a 1 in 500 chance that a new-born boy will have hypospadias.
5. Cystic fibrosis: This is a chronic disease that causes a build-up of mucus in the lungs. This mucus mainly affects males but can also happen in females if there is a problem with the vas deferens. The vas deferens carries sperm from the epididymis to the ejaculatory duct and urethra.
6. Radiation therapy: Radiation therapy can have a negative impact on sperm production. The severeness mostly depends on how close to the testicles the radiation was put.
7. Other diseases: Some diseases that can at times lower fertility of men are anaemia, Cushing's syndrome, diabetes, and thyroid disease
8. Few medications may enhance the risk of fertility issues in men. They are:
 - ✚ Sulfasalazine: Sulfasalazine can significantly lower a man's sperm count. It is often prescribed for Crohn's disease or rheumatoid arthritis. The sperm count usually returns to normal after stopping the medication.
 - ✚ Anabolic steroids: Anabolic steroids are popular with bodybuilders and athletes, and long-term use can reduce sperm count and mobility.
 - ✚ Chemotherapy: Some types of chemotherapy can also reduce sperm count.
 - ✚ Illegal drugs: The use of marijuana and cocaine can have a negative effect on a man's sperm count.
9. Age: Male fertility begins to decline after age 40.
10. Exposure to chemicals: Pesticides, for example, may increase the risk.
11. Excess consumption of alcohol: Excessive alcohol consumption may reduce male fertility. Although alcohol consumption at a moderate level does not show a negative impact on fertility in most men, it may affect men whose sperm count is low.
12. Obesity or being overweight: This might hamper the possibility of conceiving.

13. Mental stress: Stress might impact sexual activity, especially if it leads to decreased energy or motivation.

Causes of infertility in women

The factors that are involved in increasing the risk are:

- Age: Age is a risk factor that can increase the risk of conceiving.
- Smoking: Smoking elevates the risk of infertility in both men and women and can negate the effectiveness of fertility treatments. Smoking at the time of pregnancy can increase the risk of pregnancy loss, especially in the early stages of pregnancy. Passive smoking is also linked to lower the rate of fertility.
- Alcohol: Consumption of alcohol can affect the possibility of conceiving.
- Being obese or overweight: Being overweight or obese can increase the risk of infertility in both men and women.
- Disorders of diet: If an eating disorder causes severe loss in weight, fertility problems may occur.
- Diet: diet low in folate, iron, zinc, and Vitamin B-12 can affect fertility. Women who are at risk, including those who are vegan, should ask their doctor about supplements to help improve fertility.
- Exercise: Exercise is important for fertility, but too much or too little exercise can have negative effects.
- Sexually transmitted diseases (STDs): Chlamydia may harm the women's fallopian tubes and may result in inflammation of men's scrotum. Several other sexually transmitted diseases can also result in infertility.
- Exposure to certain chemicals: Some pesticides, herbicides, metals such as lead, and solvents are associated with fertility problems in both men and women. Studies in mice have shown that ingredients in some household laundry detergents can reduce fertility.
- Psychological stress: This affects ovulation in females and production of sperms in male and can result in decreased sexual activity.

- Medical conditions: Few medical conditions may hamper the fertility.
- Disorders in ovulation appear to be the most common cause of infertility in women. Ovulation is defined as the monthly release of an egg from ovaries. Eggs may never be released or may only be released in a few cycles. The following causes are possible for ovulation disorders.
 - Primary ovarian insufficiency: The ovaries might stop its functioning before the age of forty.
 - Polycystic ovary syndrome (PCOS): The ovaries may not function properly, and ovulation does not occur.
 - Hyperprolactinemia: Prominent levels of prolactin can affect ovulation and fertility if the woman is not pregnant or breastfeeding.
 - Poor egg quality: Damaged or genetically abnormal eggs cannot sustain pregnancy. The older a woman is, the higher the risk.
 - Thyroid problems: Hyperactivity or hypoactivity of the thyroid gland can lead to hormonal imbalances.
 - Chronic diseases: These include AIDS and cancer.
- Problems with the uterus or fallopian tubes: It can prevent the egg from moving from the ovaries to the uterus or uterus. If the egg does not move, it can be difficult to get pregnant naturally. The causes are as follows:
 - Surgery: Pelvic surgery can damage or damage the fallopian tubes. Cervical surgery can cause scarring or shortening of the cervix. The cervix is the neck of the uterus.
 - Submucosal myoma: A benign or benign tumor develops on the muscular wall of the uterus. They interfere with implantation and block the fallopian tubes, preventing sperm from fertilizing the egg. Large submucosal fibroids can dilate the uterine cavity and extend the distance that sperm must move.
 - Endometriosis: The cells normally found in the endometrium begin to grow elsewhere in the body.

- Previous sterility treatment: For women who choose to block the fallopian tubes, the process can be reversed, but it is unlikely that they will be born again.
- Medicines and treatments: Some medications can affect a woman's fertility.
 - Nonsteroidal Anti-Inflammatory Drugs (NSAIDs): Prolonged use of aspirin or ibuprofen can make pregnancy more difficult.
 - Chemotherapy: Some chemotherapeutic drugs can cause ovarian dysfunction. In some cases, this is permanent.
 - Radiation therapy: If this is targeted near the genitals, it may increase the risk of infertility.
 - Illegal Drugs: Some women who use marijuana or cocaine may have infertility problems.
- Cholesterol: High Cholesterol Can Affect Women's Fertility, According to One Study

Tests of infertility

- Post coital test
- Pelvic ultrasound
- Endometrial biopsy
- Hysterosalpingography
- Laparoscopy
- Hysteroscopy
- Falloposcopy

Chapter 2 – Review of Literature

India is the second most populous country in the world, but it faces a dramatic decline in fertility. According to the WHO, infertility is a male or female reproductive disorder defined as being unable to conceive after regular unprotected sexual intercourse for more than 12 months.¹

Infertility can be caused by oxidative stress in both men and women. There is ample evidence to support the vital role of reactive oxygen species (ROS) in the pathogenesis of sperm dysfunction in male infertility. Oxidizing radicles and reactive oxygen species play a detrimental role in human reproduction and male fertility.²

The etiology of infertility remains unexplained, although environmental, occupational, and lifestyle characteristics play a role. Nutritional status as an important lifestyle factor is a crucial factor in normal reproductive function.³

Testicular oxidative stress is important in several conditions known to affect male infertility. In a previous study, in infertile men with idiopathic asthenozoospermia, extrinsic administration of coenzyme Q10 increased both CoQ10 and ubiquinol (QH2) levels in semen and was effective in improving sperm kinetics. It is shown that there is. In addition, administration of vitamins E and C significantly reduced hydroxy guanine levels in sperm, resulting in an increase in sperm count.⁴

The most common type of infertility in women is ovulatory infertility. The effects of micronutrients and food groups on ovulatory infertility are related to their quality and quantity. Taking trans fats instead of carbohydrates and polyunsaturated fats is associated with increased insulin resistance and risk of infertility.⁵

Oxidative stress is associated with sex hormone malformations, abnormal transplanted follicle follicles, ovulation, and implantation. It leads to infertility, miscarriage, low birth weight, irregular bleeding, and infertility.⁶

Inappropriate follicle growth, irregular duration, conception, pre-eclampsia, and hormone metabolism are also associated with oxidative stress. This raises interest in the role of oxidative free radical damage in infertility.⁷

Free radicals are highly reactive species that can oxidize biomolecules, proteins, and lipids. Elevated levels of oxidative metabolites in these molecules have been demonstrated in different patients with different diseases.⁸

Therefore, antioxidant therapy is the most effective way to treat infertility in both men and women.

Chapter 3 – Methodology

This study is a descriptive exploratory study, which involves the study of various research articles, books, and publications to know about the ingredients that can be used to treat infertility in men and women.

On gathering the information of contents to treat infertility, this will be used to design an ideal combination for the treatment of infertility. The composition is also decided by comparing with the competitive brands which are found through the AWACS data along with performing retail chemist prescription audits and interviewing several gynecologists.

The market study of infertility combinations is done to know the growth opportunities in this area of medicine.

The duration of the study is 3 months and the tools used to perform the study are AWACS data, Research papers, publications, books, Retail chemist prescription audit and interviewing healthcare practitioners in gynecology.

Chapter 4 – Data Analysis and Findings

The ideal composition for treatment of infertility in men and women on comparing with top brands in India and some local brands of Gujarat, India along with the retail chemist prescription audit and interviewing health care practitioners in gynecology is as follows-

Table 4.1 – Composition of infertility drugs

FOR FEMALES	FOR MALES
L-Arginine- 500 mg	CoQ 10 – 200 mg
Astaxanthin – 8 mg	Astaxanthin – 16 mg
Myo-Inositol – 100 mg	L-Glutathione- 300 mg
Pyridoxal-5-Phosphate- 0.5 mg	L-Carnitine – 500 mg
Folic Acid – 5 mg	Lycopene – 50 mg
Methyl cobalamin – 750 mcg	Selenium – 200 mcg
Zinc – 22.5 mg	Vitamin C – 120 mg
Piperine – 5 mg	Vitamin E – 50 mg
Lycopene – 2000 mcg	Vitamin D3- 1000I.U.
Sodium Selenate – 100 mcg	Zinc – 22.5 mg
Element Iron – 25 mg	
Magnesium Oxide – 25 mg	
Chromium – 25 mcg	
Iodine- 50 mcg	

The role of each molecule used for the treatment of female infertility is listed below-

Table 4.2 – Role of ingredients in female infertility

COMPOSITION	ROLE
L- Arginine 500 mg	Improve blood circulation to the uterus
Pyridoxal-5 phosphate 0.5 mg	Maintain Egg integrity
Folic acid 5 mg	Improve the hormonal profile
Methylcobalamine 750 mcg	Increases the chances of female fertility
Myo-inositol 100 mg	Prevents onset of neural tube defects
Zinc sulphate Monohydrate 22.5 mg	Improves Hormonal profile
Piperine 5 mg	Helps in maintaining Egg integrity
Lycopene (10%)- 2000 mcg	Improve the hormonal profile
Selenium- 100 mcg	Helps to maintain Pregnancy
Astaxanthin – 8 mg	Enhance reproductive health
Elemental Iron (Dried Sulphate) 25 mg	Blood building nutrient
Magnesium Oxide 25 mg	Metabolism of the female hormone estrogen
Chromium 25 mcg	Helps in ovulation
Iodine 50 mcg	Proper Functioning female hormone

The role of each molecule for the treatment of male infertility is listed below-

COMPOSITION	ROLE
Astaxanthin 16 mg	Protect against oxidative damage & sperm integrity
Co-enzyme Q 10 -200 mg	Improve sperm count & sperm motility
Selenium 200 mcg	Help prevent oxidation of the male's sperm cell
L-Glutathione 300 mg	Helps to protect cells from oxidative stress.
L-Carnitine 500 mg	Helps the process of sperm development
Lycopene (as 10%) 50 mg	Affect the sperm integrity
Vitamin C 120 mg	Increase the sperm motility & sperm count
Vitamin E 50 mg	Increase the sperm motility & sperm count
Vitamin D3 1000 I.U.	Vitamin D deficiency reduces mating success and infertility
Zinc 22.5 mg	Important for the cell division & the production of healthy sperm.

Table 4.3 – Role of ingredients in male infertility

The top brands in the market along with their sales in the last five years and growth percentage are as follows-

Drugs for Female infertility-

Table – 4.4 – Market study of top brands of drugs for female infertility

		Values					
BRANDS	COM-PANY	MAT FEB'18	MAT FEB'19	MAT FEB'20	MAT FEB'21	MAT FEB'22	Percent-age growth
NORMOZ	SUN*	25.31	29.92	33.59	29.40	37.88	29%
OVA-CARE	MEYE R	16.94	19.53	21.47	21.97	24.67	12%
FERTI-SURE-F	SUN*	20.60	23.54	23.48	21.36	24.59	15%
LYCORED	JAG-SON PAL	9.36	10.55	10.86	11.94	14.67	23%
APCOD-OBIS	SHIELD	6.68	10.90	9.89	7.67	8.08	5%
FERTYL-F	AR EX	0.00	0.00	0.00	2.56	7.44	191%
CHIRO-CYST	TTK	2.99	3.91	4.00	3.98	5.75	44%
FERPILL-F	INTAS	2.64	4.07	5.28	4.47	4.72	6%
PCO CARE FORTE	AKUM ENTIS	1.13	1.28	1.43	1.23	2.46	100%

CER-VIFERT	AKUM ENTIS	1.71	2.02	2.35	1.71	2.44	42%
TOTAL		114.03	133.99	137.33	123.00	156.74	27%

Drugs for Male infertility-

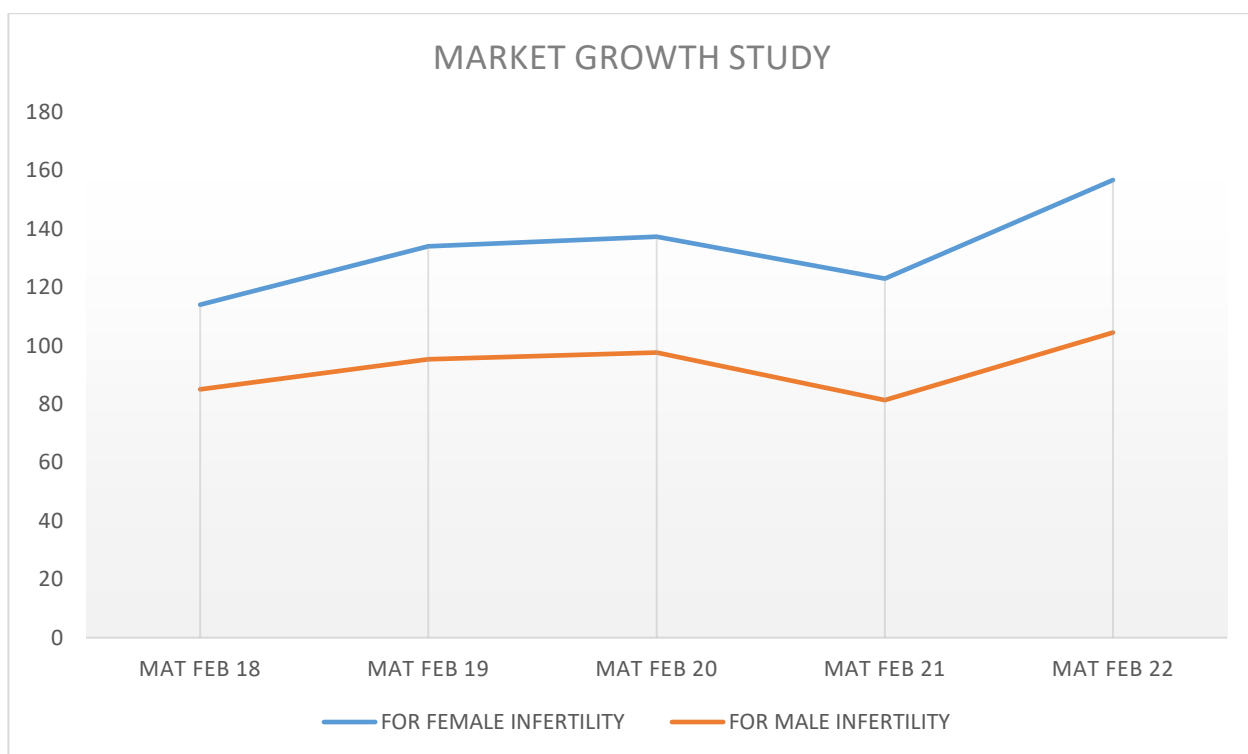
Table 4.5- Market study of top brands of drugs for male infertility

		Values					
BRANDS	COMPANY	MAT FEB'18	MAT FEB'19	MAT FEB'20	MAT FEB'21	MAT FEB'22	Percentage growth
FERTISURE-M	SUN*	18.46	19.46	18.90	17.21	21.42	24%
LINEATOR	AKUMENTIS	8.15	11.19	11.40	8.53	13.65	60%
MAXOZA-L	SUN*	13.62	13.89	12.93	10.15	12.20	20%
PATERNIA-XT	ZYDUS CADILA*	6.01	7.56	9.24	8.69	11.08	27%
KQ-100	SERUM INSTITUTE	8.14	8.30	8.77	8.15	10.88	33%
NANO-LEO	JB CHEMICAL	11.38	12.62	11.93	7.43	8.98	21%

LYCO-Q 100	TTK	4.37	3.90	4.36	4.28	5.28	23%
ERACT-X	ZYDUS CADILA*	0.00	2.01	4.57	3.73	4.12	10%
ASTHOQUE	LA RENON	3.93	3.90	3.34	2.73	3.81	39%
FERTI-HOPE	TABLETS INDIA	1.41	1.78	2.07	2.17	2.50	15%
TOTAL		85.01	95.29	97.62	81.35	104.50	28%

The growth of market of infertility drugs is evaluated by using the below shown graph and data-

	MAT FEB 18	MAT FEB 19	MAT FEB 20	MAT FEB 21	MAT FEB 22
FOR FEMALE INFERTILITY	114.03	133.99	137.33	123	156.74
FOR MALE INFERTILITY	85.01	95.29	97.62	81.35	104.50



Graph- 4.1 – Market growth study of infertility drugs

The comparison of ideal composition along with the top and some known local brands is given below-

For female infertility-

Table 4.6 – Brand composition comparison of drugs for female infertility

BRYFERT F	FERTILLIA F	FERTFULL F	FERTI-SURE F	FERTYL F
L-Arginine - 500 mg	L- Arginine - 200 mg	L-Arginine - 500 mg	L-Arginine - 5 mg	L-Arginine - 5 mg
Myo-inositol - 100 mg	Myo-inositol - 100 mg	Myo-inositol - 100 mg	-	Myo-Inositol - 500 mg
Pyridoxal-5-Phosphate - 0.5 mg	-	Pyridoxal-5-Phosphate - 0.5 mg	-	-

Folic Acid - 5 mg	-	Folic Acid - 5 mg	Folic Acid - 100 mcg	Folic Acid - 0.5 mg
Methylcobala- min- 750 mcg	Methylcobala- min - 1500 mcg	Methylcobala- min- 750 mcg	Vit B12- 1 mcg	-
Zinc - 22.5 mg	Zinc - 22.5 mg	Zinc - 22.5 mg	Zinc - 7.5 mg	Zinc - 7.5 mg
Piperine - 5 mg	Piperine - 5 mg	Piperine - 5 mg	-	-
Lycopene - 2000 mcg	Lycopene - 5 mg	Lycopene - 2000 mcg	Lycopene - 1 mg	Lycopene - 5 mg
Sodium selenate - 100 mcg	Sodium selenate - 100 mcg	Sodium selenate - 100 mcg	Selenium - 40 mcg	-
Astaxanthin - 8 mg	Astaxanthin - 8 mg	Astaxanthin - 8 mg	Astaxanthin - 4 mg	Astaxanthin - 8 mg
Element Iron - 25 mg	Iron - 25 mg	Element Iron - 25 mg	Iron - 21 mg	-
Magnesium Ox- ide - 25 mg	-	Magnesium Ox- ide - 25 mg	-	-
Chromium - 25 mcg	Chromium - 200 mcg	Chromium - 25 mcg	-	-
Iodine - 50 mg	-	Iodine - 50 mg	-	-
-	CoQ10 - 25 mg	-	-	-
-	D-Chiro Inosi- tol- 2.5 mg	-	-	D-Chiro Inosi- tol - 12.5 mg
-	Vit D3- 1000 IU	-	-	-

-	L-Methyl folate - 1 mg	-	-	-
-	-	Benfotiamine - 25 mg	-	-
-	-	-	Vit B6- 1.5 mg	Pyridoxine HCl - 1.5 mg
-	-	-	-	Ferrous Glu- conate - 25 mg
-	-	-	-	Vit B12- 7.5 mcg
-	-	-	-	Melatonin - 1.5 mg

For male infertility-

Table 4.7 – Brand composition comparison of drugs for male infertility

BRYFERT M	FERTILLIA M	FERTFULL M	FERTISURE M	KQ 100
coQ 10 - 200 mg	CoQ 10 - 200 mg	CoQ 10 - 200 mg	CoQ 10 - 50 mg	CoQ 10- 100 mg
Astaxanthin - 16 mg	Astaxanthin - 16 mg	Astaxanthin - 16 mg	Astaxanthin- 8 mg	-
L-Glutathione - 300 mg	-	L-Glutathione - 300 mg	-	-
L-Carnitine - 500 mg	L-Carnitine - 500 mg	L-carnitine- 500 mg	L-Carnitine - 340 mg	Carotenoids - 9 mg

Lycopene - 50 mg	Lycopene - 5000 mcg	Lycopene- 50 mg	Lycopene - 2.5 mg	Lycopene - 5000 mcg
Selenium - 200 mcg	Selenium - 40 mcg	Selenium - 200 mcg	-	Selenium - 36 mcg
Vitamin C- 120 mg	-	Vitamin C- 120 mg	-	-
Vitamin E - 50 mg	-	Vitamin E - 50 mg	-	-
Vitamin D3 - 1000 IU	-	Vitamin D3 - 1000 IU	-	-
Zinc - 22.5 mg	Zinc - 12 mg	Zinc - 22.5 mg	Zinc - 5 mg	Zinc- 6,5 mg
-	-	-	-	L-Arginine- 450 mg
-	-	-	-	omega 3 fatty acid - 300 mg
-	-	-	-	EPA - 90 mg
-	-	-	-	DHA - 60 mg
-	-	-	-	Piperine - 5 mg
-	-	-	-	Vit B12- 0.5 mcg

Chapter 5 – Results and Discussion

On performing the study, it was seen that as the prevalence of infertility is increasing day by day, so is the need for drugs for infertility. The market of drugs of female infertility has grown by 27% in 2022 when compared with 2021. The case of drugs for male infertility is similar. It is grown at the rate of 28% in 2022 than 2021.

This growth in the market of drugs indicate that the prevalence of infertility is increasing. Apart from the prevalence, it can also be said that the awareness regarding infertility among the population of India is increasing. The awareness regarding any issue in the country leads to more patients reaching the health care professionals which is a positive sign in the growth of any nation.

Many factors can affect the increasing rates of infertility. The most common of all is the changing lifestyle of the people. The diet nowadays is not up to the mark. Along with this westernization has led to increase in consumption of alcohol and smoking which thereby decreases the fertility rates.

Considering all the above factors, it becomes necessary to provide all the essential vitamins, minerals, and antioxidants externally. This brings the need of combinations for infertility. For the ideal composition to support fertility in both men and women was found by comparing the formulas of top and reference brands. Along with this field work was performed for retail chemist prescription audit. RCPA is a tool that helped to know the brands and molecules that are trusted by the gynecologists the most and are prescribed by them. This enabled us to know the results of various combinations and thus, helped to decide an ideal composition for the supportive therapy of infertility in males and females.

Table 4.6 and 4.7 helped to create the USP and point of differentiation between the top brands and reference brands with BRYFERT F and BRYFERT M, respectively.

The Brand BRYFERT F is superior to the top brand of Sun pharma – Fertisure F as it contains L-Arginine 500 mg which is an essential dose for the poor responder patients to increase the endometrial receptivity, ovarian response, and pregnancy rate. Whereas Fertisure F contains L-Arginine 5 mg only. Myo-Inositol in Bryfert F is 100 mg which is beneficial to improve the quality of embryos, reduce the unsuitable oocytes and required amount of stimulation drugs. Myo-Inositol is absent in the brand Fertisure F.

The brand BRYFERT M is superior to the brand FERTISURE M as the quantity of Astaxanthin provided in BRYFERT M is 16 mg, which is the required quantity to treat infertility in men. It is the most potent antioxidant and thus, reduces the Reactive oxygen species, decrease the DNA damage, increases spermatogenesis (Formation of sperms), and reduces inhibin B efficiently. Whereas in Fertisure M, the quantity of astaxanthin given is only 8 mg which is not appropriate dose as per RDA guidelines.

The dosing of all the ingredients in Bryfert F and Bryfert M are decided according to the

This study proved beneficial for the company- Bryson Pharmaceutical as the company had to launch combinations for infertility. This study helped the organization to come to a decision for deciding the composition of their products named- BRYFERT F and BRYFERT M for female and males fertility combinations, respectively.

LIMITATIONS OF STUDY

The limitations of project undertaken is recognized as the study is performed with the constraint of area as only two states i.e., Gujarat and Madhya Pradesh are covered during the study. If the study would have been performed all over India, the results might have been little different than received now.

FUTURE DIRECTIONS

The study requires more attention on the part of selection of area. If the study is performed all over India, better results and findings can be expected.

References

1. Who.int. 2022. Infertility. [online] Available at: <<https://www.who.int/news-room/fact-sheets/detail/infertility#:~:text=Infertility%20is%20a%20dis-ease%20of,on%20their%20families%20and%20communities.>> [Accessed 24 June 2022].
2. Medicalnewstoday.com. 2022. Infertility: Causes, diagnosis, risks, and treatments. [online] Available at: <<https://www.medicalnewstoday.com/articles/165748>> [Accessed 24 June 2022].
3. Mayo Clinic. 2022. Infertility - Symptoms and causes. [online] Available at: <<https://www.mayoclinic.org/diseases-conditions/infertility/symptoms-causes/syc-20354317>> [Accessed 24 June 2022].
4. Encyclopedia, M., 2022. Infertility: MedlinePlus Medical Encyclopedia. [online] Medlineplus.gov. Available at: <<https://medlineplus.gov/ency/article/001191.htm>> [Accessed 24 June 2022].
5. En.wikipedia.org. 2022. Infertility - Wikipedia. [online] Available at: <<https://en.wikipedia.org/wiki/Infertility>> [Accessed 24 June 2022].
6. WebMD. 2022. Infertility Treatments. [online] Available at: <<https://www.webmd.com/infertility-and-reproduction/guide/understanding-infertility-treatment>> [Accessed 24 June 2022].
7. <https://www.nichd.nih.gov/>. 2022. What infertility treatments are available? [online] Available at: <<https://www.nichd.nih.gov/health/topics/infertility/condition-info/treatments>> [Accessed 24 June 2022].
8. UCLAhealth.org. 2022. What is Infertility: Infertility Causes, Treatment, Infertility Doctors - UCLA. [online] Available at: <<https://www.uclahealth.org/obgyn/infertility>> [Accessed 24 June 2022].
9. 1mg. 2022. Fertisure M Tablet: View Uses, Side Effects, Price, and Substitutes | 1mg. [online] Available at: <<https://www.1mg.com/drugs/fertisure-m-tablet-153861>> [Accessed 24 June 2022].

10. 1mg. 2022. Fertisure F Nutraceutical Tablet: Buy strip of 10 tablets at best price in India | 1mg. [online] Available at: <<https://www.1mg.com/otc/fertisure-f-nutraceutical-tablet-otc564546>> [Accessed 24 June 2022].
11. 1mg. 2022. Ovacare Tablet: Buy strip of 15 tablets at best price in India | 1mg. [online] Available at: <<https://www.1mg.com/otc/ovacare-tablet-otc71094>> [Accessed 24 June 2022].
12. Ameliahealthcare.com. 2022. Amelia Healthcare – Amelia Healthcare. [online] Available at: <<http://ameliahealthcare.com/fertilia-f.php/>> [Accessed 24 June 2022].
13. 1mg. 2022. Fertyl-M Tablet: View Uses, Side Effects, Price, and Substitutes | 1mg. [online] Available at: <<https://www.1mg.com/drugs/fertyl-m-tablet-135092>> [Accessed 24 June 2022].
14. 1mg. 2022. Fertfull-F Tablet: Buy strip of 10 tablets at best price in India | 1mg. [online] Available at: <<https://www.1mg.com/otc/fertfull-f-tablet-otc347698>> [Accessed 24 June 2022].

APPENDIX 1

The retail chemist prescription audit performed at chemists and stockists is as follows-

CUSTOMER POTENTIAL TRACKER										
	BE NAME: -							State: -		
	HQ NAME: -									
Sr . No	Chemist Name	DR. Name	Spec	No. of Pts /Day	Business Potential per Month Rs.	BRYFERT F		BRYFERT M		Total Potential of Dr. (Rs.)
						Brand	Units /Mth	Brand	Units /Mth	
						1- Normoz (Sun)		1- Lineator (Akumensis)		
						2- Fertyl F (Ar Ex)		2- Carni Q (TTK)		
						3- Ferti-sure F (Sun)		3- Ferti-sure M (Sun)		
						4-Lycored (Jagson Pal)		4- KQ 100 (Serum)		