

# A Systematic Review of Recent Trends in Management of Infertility: Global and Indian Perspective

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**Abstract:** *It is a systematic review on recent trends in infertility management among couples suffering from infertility. Recent trends in infertility management define those advance technologies which are used in diagnosis and treatment of infertility. With the advancements in reproductive medicines and the experiences gained through the specialised infertility management clinics, a wider range of diagnostic and treatment options have become available to the infertile couples. The objective of review is to provide comprehensive review of infertility management among infertile couples. Search was done using electronic database such as pubmed, online journal, access open, Cmaj open, google scholar, online library etc. Total 198 studies were found on infertility management. Nine studies fulfilled the inclusion criteria of the study and these studies were included in the systematic review. Studies are done between 2015 to 2020. Majority of studies used laparoscopy as therapeutic measure in management of infertility. Rest of the studies used ART, OS, varicocele ligation, Seminal analysis, Vitamin D supplementation with ICSI, HSG, SSG and nutritional supplement, Stress management to treat infertility.*

**Keywords:** Infertility, Pregnancy, Trends, Eligible couple, ART, Interventions

## 1. Introduction

The birth of the baby is a significant life event influenced by cultural norms and expectations. But couples are not able to experience the pleasure of parenthood due to inability to conceive or infertility. It affects their personal, interpersonal, social, and religious expectations which cause a sense of failure, marital disharmony, loss and exclusion. It is estimated that globally between 60-80 million couples suffer from infertility every year, of which probably between 15-20 million are in india alone. Approximately 8-10% of couples within the reproductive age group present for medical assessment, generally following 2 years of failed efforts to reproduce.

Infertility is commonly defined as the inability to conceive despite two years of cohabitation or regular unprotected sexual intercourse. Clinically, infertility is a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. Infertility may be primary or secondary. Primary infertility refers to infertility of a couple who have never been able to conceive whereas secondary is the failure to conceive following a previous pregnancy. Due to physiological, familial, and community pressure in producing a biological child, most of the couples seek effective help. Over the years with the advancement in knowledge of reproductive physiology and availability of sensitive and specific diagnostic methods and treatments, infertility management has improved considerably. Here we will look at the recent trends or advance therapeutic measures to manage infertility.

The aim of this systematic review is to compile and compare those studies in which infertile couples had gone through some advance infertility treatment.

## 2. Methods

1. Case control study, 2. Comparative studies, 3. Prospective studies, 1cross sectional research, 1 double blind clinical trial, 1 observational study were included in the review. Based on the objectives of the current review, inclusion and exclusion criteria were prepared and various data bases were used in the selection of studies. The collected study were deeply checked and reviewed for clarity and authenticity of content and then has been used for the review.

### Inclusion criteria

1. Studies where the participants were infertile male & female
2. Studies where the infertile participants come under the age group of eligibility criteria to conceive or to become pregnant.
3. Studies that include interventions for infertility management such as OS, ART, HSG, Psychotherapy, Laproscopic chromopertubation, Varicocele Ligation, Vitamin D supplementation, ICSI, seminal analysis, nutrient supplementation (By calcium, vitamin c, folic acid, vitamin E)
4. Published in English language and peer reviewed from 2015 to2020.
5. Both individual and couple based interventions
6. Studies that result in fertility improvement by recent advancements in infertility management.

### Exclusion criteria

1. Participants who do not come under eligibility criteria for fertility age or eligible couple.
2. Studies that include those participants who have completed their family.
3. Unpublished articles.

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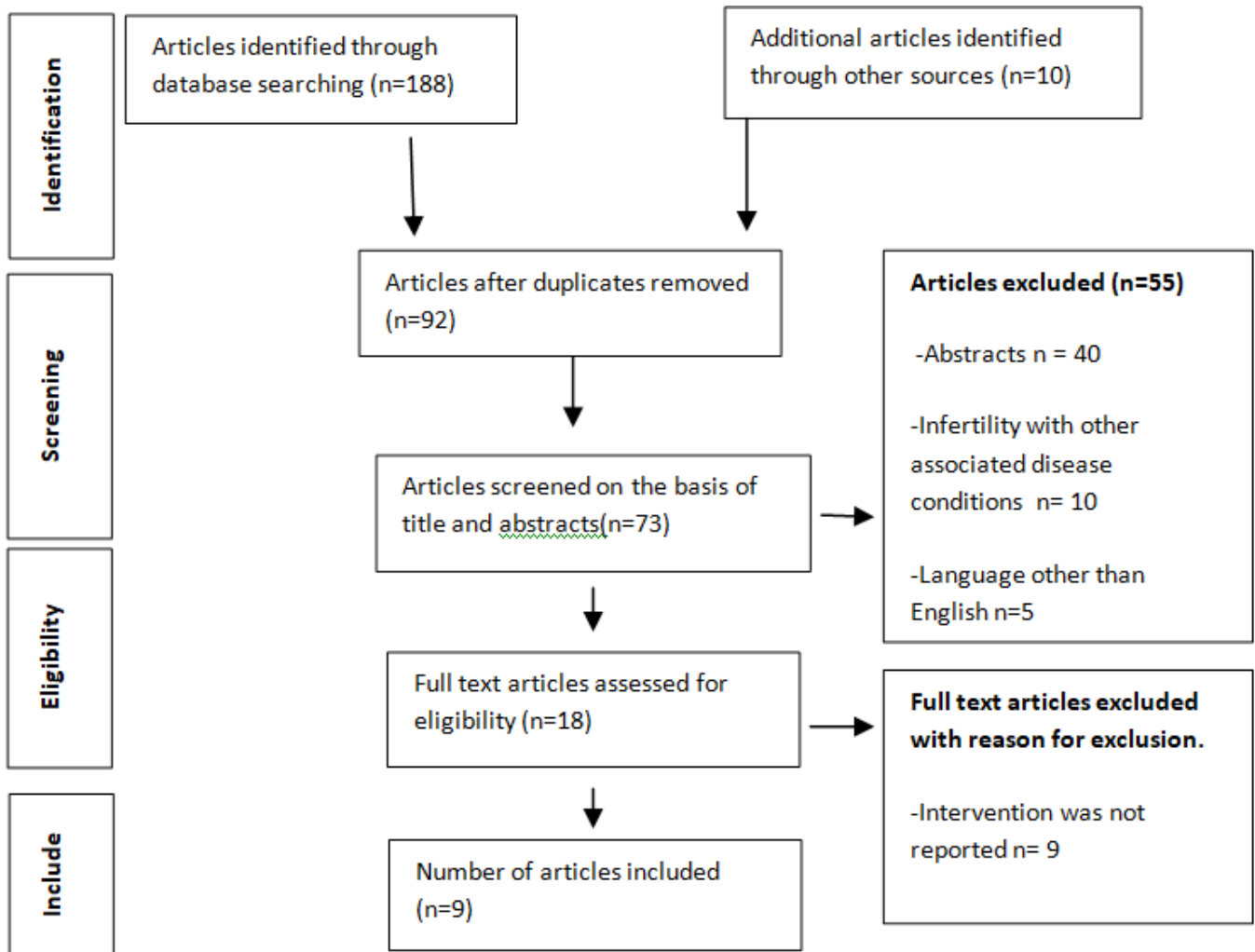
**Electronic database searching:-**

Pubmed, online journal, Access open, Google scholar, Online library, Cmaj OPEN.

**Data extraction and quality assessment:-**

PRISMA flow diagram was used to select and extract the articles. Eligibility criteria were assessed of extracted data,

if these can be a part of the review. Included studies were evaluated for relevance, clarity, completeness, appropriateness and methodology. Those studies that were not meeting the criteria were excluded. Articles selected for systematic review were assessed by two independent reviewers. The extracted studies included the characteristics such as author, year of publication, research design, no. of participants, sample characteristics, type of intervention, treatment setting and research gap.



**Figure 1:** PRISMA flow diagram showing the selection of review articles

**Analysis:-** steps in analysis of selected reviews are as following-

**Step 1:-Tabulation and classification**

Obtained data were tabulated and classified as author, year of publication, research design, no. of participants, sample characteristics, type of intervention, treatment setting and research gap.

**Step 2:-Identifying the findings of the studies**

The study findings were identified according to their selected data or characteristics such as author, year of publication, research design, no. of participants, sample characteristics, type of intervention, treatment setting and research gap.

**Step 3:-Categorising the findings**

Findings of the studies were categorised and described according to selected data or characteristics.

**3. Results**

The review study included 198 potentially relevant articles. out of which 106 studies were excluded as duplicate, 19 articles were excluded on the basis of title and abstract, 55 were excluded as they did not meet the inclusion criteria, 9 articles did not mention the intervention and finally 9 studies were included for the review.

**Characteristics of the articles:-** out of 9 studies included in the review, 1 was case control, 2 were comparative

studies, 3 were prospective studies, 1 was cross sectional research, one was double blind clinical trial, and 1 was observational study.

- Majority of the interventions were conducted in hospital setting.

- All the studies included infertile participants of both genders, who were seeking for the diagnosis and treatment of infertility.
- These studies were published between 2015 and 2020. (table-1)

**Table 1:** List of studies included in the review (n=9)

S. N.	Study/ Author	Year of publication	Research design	No. of participants	Sample characteristics	Intervention type and component	Treatment setting	Research gap (RG1 to RG9)
1.	Sambharam K. et al	2015	Comparative study	60	Infertile female	SSG and Laparoscopy	Hospital	No. of cases is very small, needs to do further studies on large no. as to give conclusive results
2.	Meng Q et al	2015	Prospective follow up design	2151	Couples planning to become pregnant	Nutrient supplementation with Ca, vit C, Folic acid, vit E	MCH centre	-Exclusion of couples who had already become pregnant before marriage could have result in an over estimation of the fertility rate because China has one child policy. -Study is limited to rural area.
3.	Patel A et al	2016	Cross sectional research	300	Infertile married men	Psychotherapy for stress management	clinic	It was only a single clinic based cross sectional study and the finding were constrained due to small size and limited time frame to conduct research.
4.	Kalpna et al	2017	Comparative study	71	Infertile females with tubal blockage	HSG, SSG, Laproscopic chromopertubation	Hospital	Small sample size, can be done on large sample
5.	Cooly V. et al	2017	Prospective study	400	Infertile couples	Seminal analysis of male partner	Infertility clinic	Only one diagnostic tool semen analysis is under study. Further studies are required focusing on molecular basis to identify the male infertility.
6.	Abedi S. et al	2019	Double blind clinical trial	85	Infertile women	Vitamin D supplementation with ICSI	Hospital	Role of vit D supplementation during ART remains controversial so there is more room for further study and find out which parameters are more affected by vitamin D deficiency and thereby supplementation. Confounding

								factors also affect vit D level.
7.	Vasant Dilip K. A. et al	2019	Prospective study	30	Adult infertile males suffering from unilateral or bilateral varicocele	Varicocele ligation	Hospital	Sample size is small, can be done on large sample
8.	Nisar Shazia, Bandy S. S.	2019	Observational study	70	Infertile Females	Laproscopy for various factors responsible for infertility	Hospital	Only one therapeutic measure is used, various measures can be used simultaneously.
9.	Gorgui J. et al	2020	Case control analysis	2055	Infertile women	ART and OS (Assisted reproductive technology and ovarian stimulation)	Hospital	We can not rule out the effect of unmeasured confounders, especially in relation to underlying infertility.

#### 4. Limitations of Review

This review has some limitations. First this review included only published literature in English. This would have resulted in missing of some crucial information. Second review is based on a small number of studies.

#### 5. Conclusion

In this paper, I have reviewed recent trends in infertility management from global and Indian perspectives. The systematic review highlight research gaps labeled as RG1 to RG9. It is important that researchers identify success factors and critical factors in successful deployment of recent trends in infertility management in global as well as Indian scenario. Each couple has the right to have a child because child is considered as a kind of old age insurance. Investigations for infertility could be conducted at various levels of health care system. Effective mechanism need to be implemented to regulate and manage high technology treatments for infertility which are offered mostly in the private sector, have low success rates and are expensive. It is therefore essential to reduce the costs involved in offering advance treatments so that all the infertile couples could reap the benefits of newer technologies. It is also essential to eliminate the preventable causes of infertility.

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#### Conflicts of Interest

There are no conflicts of interest.

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