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DEMOGRAPHY AND FAMILY PLANNING

✓ DEMOGRAPHY

Demography is the scientific study of human population. It focusses its attention on the following three observable human phenomenon:

1. Change in population size (growth or decline)
2. Composition of population
3. Distribution of population in space.

The demographic processes which determine these phenomena are:

- | | | |
|--------------|---------------------|-------------|
| 1. Fertility | 2. Mortality | 3. Marriage |
| 4. Migration | 5. Social mobility. | |

Demographic cycle

A look back into the history shows that every nation passes through five stages of demographic cycle.

1. **First stage (High Stationary):** It is characterised by high birth rate and high death rate which cancel each other. So the population remains stationary. India was in this stage till 1920.
2. **Second stage (Early Expanding):** There is a decline in death rate while the birth rate remains unchanged. So the population expands. Many developing countries of Asia and Africa are in this stage.

3. **Third stage (Late Expanding):** Death rate declines further and birth rate begins to fall. Yet there is an increase in population since birth exceeds deaths. India appears to have entered this stage.
4. **Fourth stage (Low Stationary):** Low birth rate and low death rate. So the population becomes stationary. Sweden, Belgium, Denmark and Switzerland are in this stage.
5. **Fifth stage (Declining):** Population begins to decline as birth rate is lower than death rate. East European countries like Germany and Hungary are now in this stage.

✓ FERTILITY

Fertility is the actual bearing of children. Some demographers prefer the word **natality** in place of fertility. **Facundity** is the capacity to have children.

Factors regulating fertility

The following are important factors which regulate fertility. A knowledge of these factors is important in family planning.

1. **Age at marriage:** Early marriage is a long established custom in India. The disadvantages of early marriage are
 - a) Population growth due to increased child birth
 - b) adverse effect on the health of women.
2. **Duration of married life:** Maximum child birth occurs in the first 15 years of married life. So efforts for family planning must be concentrated only during these early years of married life.
3. **Spacing of children:** Spacing between births reduces fertility rates.
4. **Education:** Educated women give birth to lesser number of children when compared to illiterates.

5. **Economic status:** Fertility decreases with an increase in per capita income. Therefore economic development is considered to be the best contraceptive.
6. **Caste and Religion:** Muslims show higher fertility than Hindus. Among Hindus, fertility is high in lower castes.
7. **Nutrition:** It has an indirect effect. Well fed societies show lower fertility rate.
8. **Family planning:** It is an important factor which can lower fertility.
9. **Other factors:** Cultural and social factors like i) position of women in society ii) value of children iii) customs and beliefs iv) widow remarriage v) industrialisation vi) unbanisation etc. can affect fertility.

✓ INDICATORS OF FERTILITY

Fertility can be measured by a number of indicators. The following are a few important indicators.

1. **Crude birth rate (CBR):** It is defined as the number of live births per 1000 mid - year population in a given year. It is given by the formula:

$$CBR = \frac{\text{Total live births during the year}}{\text{Mid year population}} \times 1000$$

2. **General fertility rate (GFR):** It is the number of live births per 1000 women in the reproductive age group (15 to 45 years) in a given year. GFR is expressed by

$$\frac{\text{Total live births}}{\text{No. of females in the age group of 15-45 years}} \times 1000$$

3. **General marital fertility rate (GMFR):** It is the number of live births per 1000 married women in a given year in the reproductive age group (15 to 45 years)

4. **Age specific fertility rate (ASFR):** It is the number of live births in a year to 1000 women in any specified age group (like 16-20 years, 21 to 25 years etc)
5. **Total fertility rate (TFR):** It is the sum of all Age specific fertility rate. It is obtained by adding all Age specific fertility rates (like ASFR of 16-20 years + 21-25 years + 26-30 years..... so on upto 41-45 years). TFR indicates the average number of children a woman will have if she passes through her reproductive years (15 - 45 years)
6. **Gross reproduction rate (GRR):** It is the average number of girls that would be born to a woman during her reproductive period (15 - 45 years). This is true if she experiences the same fertility pattern and there is no mortality.
7. **Net reproduction rate (NRR):** It is the number of daughters a new born girl will have during her life time. NRR of 1 is equivalent to attaining 2 child norm. The present level of NRR in India is 1.48.

✓ FAMILY PLANNING

Definition

Family planning is defined as a way of thinking and living that is adopted voluntarily, upon the basis of knowledge, attitude and responsible decisions by individuals and couples in order to promote the health and welfare of the family group and thus contribute effectively to the social development of a country. This is the WHO definition of family planning.

Objectives of Family planning

1. To avoid unwanted births.
2. To bring about wanted births.
3. To regulate intervals between pregnancies.

4. To control the time at which births occur in relation to the age of the parent.
5. To determine the number of children in the family.

Importance of Family planning on health

Family planning **avoids and also prevents** a variety of adverse effects on the health of mother, foetus and child.

Mother: The adverse effects prevented are:

1. Maternal depletion
2. Maternal morbidity
3. Maternal mortality
4. Lowered nutritional status
5. Complications of pregnancy.

Foetus: Preventable effects are:

1. Foetal under - nutrition
2. Foetal mortality.

Child : The following can be prevented

1. Mortality of children
2. Protein energy malnutrition (PEM)
3. Inadequate child care
4. Emotional consequences of inadequate care.

FAMILY WELFARE

The term **family welfare** is now used in place of the previous term family planning. Family welfare signifies "*the improvement of the quality of health and welfare of the entire family*".

Family welfare includes

1. Spacing and limitation of births
2. Advice on sterility
3. Education of parenthood
4. Sex education
5. Genetic counselling
6. Carrying out pregnancy tests

7. Services to unmarried mothers
8. Premarital examination and counselling
9. Maternity and child health (MCH) services
10. Immunisation service.

✓ **CONTRACEPTIVE METHODS**

Definition

Contraceptive methods are preventive methods which help women to avoid unwanted pregnancies.

Classification of contraceptive methods

A. TEMPORARY METHODS (*Spacing methods*)

1. Barrier methods: Physical methods
Chemical methods
Combined methods
2. Intra - Uterine devices
3. Hormonal methods
4. Post conceptional methods
5. Miscellaneous

B. PERMANENT METHODS (*Terminal methods*)

1. Male sterilisation
2. Female sterilisation.

TEMPORARY METHODS

Barrier Methods

Barrier or occlusive methods suitable for both men and women are available. The aim of these methods is to prevent the sperm meeting the ovum. The barrier methods are further classified as a. Physical methods b. Chemical methods c. Combined methods

PHYSICAL METHODS (Mechanical methods)

They include 1. condom 2. diaphragm
3. Vaginal sponge.

1. Condom

It is a male contraceptive. It is made from latex. In India, it is commonly known by the trade name **Nirodh**. It is fitted on the erect penis before intercourse.

Mechanism: It acts by preventing deposition of semen in the vagina.

Precautions:

1. It must be free from tears and leaks. So it must be tested by filling with water.
2. It must be discarded after single use.
3. After intercourse, it must be carefully removed from vagina to prevent spilling of semen into the vagina.

Advantages:

1. Inexpensive, safe, easy to use and reliable.
2. Affords protection against STD and AIDS.
3. No side effects
4. Light, compact and easily disposable.

Disadvantages:

1. Due to incorrect use, it may slip off or tear during coitus.
2. It interferes with sex sensation locally.

2. Diaphragm

It is a vaginal barrier used by women. It is a shallow cup made of synthetic rubber or plastic material. It has a diameter of 5 - 10 cm. It has a flexible rim made of spring or metal. It is inserted in the vagina before sexual intercourse. It must remain in place for not less than 6 hours after intercourse.

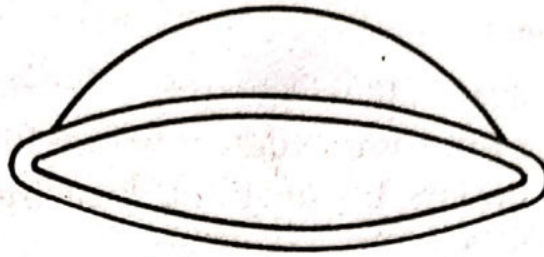


Fig.3. Diaphragm

Advantages:

Total absence of risks and medical contraindications.

Disadvantages:

1. Initially, a physician or a trained person is required to demonstrate the method of insertion.
2. Privacy is required for insertion.
3. If left in the vagina for prolonged period, it may produce a toxic shock syndrome.

3. Vaginal sponge

It is marketed under the trade name **Today**. It is a small polyurethane sponge measuring 5 × 2.5 cm. It is saturated with a spermicide, nonoxynol - 9.

CHEMICAL METHODS

They make use of chemical spermicides. They are used in the form of:

1. Foams (foam tablets, foam aerosols)
2. Creams, pastes and jellies
3. Suppositories
4. Soluble films

Mechanism:

These preparations contain surface active agents which attach to the spermatozoa. They inhibit oxygen uptake and kill the sperms.

Disadvantages:

1. High failure rate
2. Must be used immediately before intercourse.
3. Mild irritation, burning and measiness.

INTRA - UTERINE DEVICES (IUD)**Historical aspects**

Arabs were the first to use the principle in camel. Introduction of small stones into the uterus of camels prevented conception. In 1909, original devices made of silkworm gut was used. In 1929, Gafenbergh, a Gynaecologist used an IUD made of silver.

Types of IUD

1. First generation IUDs : Lippe's loop
2. Second generation IUDs: Copper T
Copper 7
Nova T
Multiload devices.
3. Third generation IUDs : Progestasert

First generation IUDs

They are inert, non - medicated devices made of polyethylene or other polymers. They appeared in various shapes and sizes like loops, spirals, coils and rings. **Lippes loop** is the commonly used device.

Lippe's loop: It is a double - S shaped device made of polyethylene which is non - toxic, non - reactive and durable. It contains a small amount of barium sulfate which allows X - ray examination. Also it has attached threads (tail) which project into the vagina. The feeling of thread in the vagina assures that the loop is in its place.

Advantages

1. Simple and easy insertion
2. Inexpensive
3. Reversible method
4. Does not interfere with sexual pleasure

Disadvantages

1. Needs a trained person for insertion
2. Needs adequate follow up
3. Should be replaced periodically (2 - 4 years)
4. Rarely it can produce cancer of uterus or fibroid.

Second generation IUDs

The second generation IUDs are copper containing devices. Older devices are copper - 7 and copper T - 200. Newer ones are Nova T and Multiload devices.

Mechanism

They act by releasing copper into the uterus. Copper enhances cellular response in endometrium and alters the composition of cervical mucosa.

Advantages

1. Low expulsion rate
2. Lower incidence of side effects like pain and bleed
3. Easier to fit even in nulliparous women
4. Increased contraceptive effect
5. Effective as post - coital contraceptive if inserted within 3 to 5 days after intercourse.

Third generation IUDs

These devices act by releasing a hormone. The currently used device is **Progestasert**. It is a T - shaped device filled with progesterone, a natural hormone. It acts by releasing 65 micrograms of the hormone daily in the uterus. It has a direct local action on the cervical mucosa.

and sperms. Since the hormone is gradually depleted, regular replacement of the device is necessary.

Another similar hormonal device is a T-shaped IUD which releases levonorgestrel. It has an effective life of 5 years.

HORMONAL CONTRACEPTIVES

Hormonal contraceptives are the most effective spacing methods of contraception. These hormonal contraceptives can be administered orally by injection or as implants. But oral pills are more commonly used.

Composition

These contraceptives contain a combination of both oestrogen and progestogen or prostogen only.

Mechanism

These contraceptives suppress the regular monthly peaks of pituitary and ovarian hormones which is necessary for ovulation. So ovulation does not occur.

Classification of Hormonal contraceptives

<i>Oral pills</i>	:	Combined pill Progestogen-only pill (POP) Post-coital pill Once-a-month pill Male pill
Depot formulations (slow release)	:	Injectables Subdermal implants Vaginal rings

ORAL PILL (Oral contraceptives)

1. Combined Pill

These pills contain 30 to 35 micrograms of a synthetic oestrogen and 0.5 to 1mg of a progestogen. One pill daily is given orally, for 21 days beginning on the 5th day

Adverse effects of oral contraceptives

1. **Cardiovascular:** Myocardial infarction and thromboembolic complications.
2. **Carcinogenesis:** Cancer of breast and genitalia.
3. **Metabolic:** Hyperglycemia and glycosuria, atherosclerosis and elevation of blood pressure.
4. **Liver disorders:** Hepatocellular adenoma and jaundice.
5. **Other effects:** Breast tenderness, weight gain, headache, migraine, nausea and vomiting.

Advantages

1. Easy to use by oral route
2. Almost 100% effectiveness
3. Non-contraceptive benefits like protection from breast disorders, ovarian cyst/cancer, iron deficiency anemia and pelvic inflammation.

Disadvantages

1. Cost is prohibitive and so the government has subsidised it and also supplies free of cost.
2. Side effects and also contraindications.
3. Reduced breast milk production
4. Return to fertility may be delayed.

✓ **POST - CONCEPTIONAL METHODS** (Termination of pregnancy)

They include 1. Menstrual regulation 2. Menstrual induction 3. Abortion

Menstrual regulation

It is a relatively simple method of birth control. It consists of aspiration of uterine contents within 6 to 14 days of a missed period but before tests can confirm pregnancy. Usually, no after care is required.

Immediate complications: Uterine perforation and trauma.

Late complications: Tendency to abortion or premature labour, infertility, menstrual disorders, increase in ectopic pregnancies and Rh - immunisation.

Menstrual induction

It consists of intrauterine application of 1.5 mg solution of prostaglandin F₂. It disturbs the normal progesterone - prostaglandin balance. It is performed under sedation. Within a few minutes, there is sustained contraction of the uterus for 7 minutes followed by cyclic contractions for 3 to 4 hours. Later bleeding starts and continues for 7 to 8 days.

ABORTION

Definition

Abortion is defined as termination of pregnancy before the foetus becomes viable (capable of living independently). This has been fixed administratively at 28 weeks. The optimal time for abortion is the 7th and 8th week of gestation. The Indian Law (MTP act 1971) allows abortion only upto 20 weeks.

Medical Termination of Pregnancy Act (MTP Act 1971)

The MTP Act was passed in 1971 in order to:

1. reduce maternal mortality resulting from illegal abortions
2. provide an opportunity for women to adopt some form of contraception

Conditions under which pregnancy can be terminated under MTP Act 1971: They are:

1. **Medical:** When pregnancy is likely to endanger mother's life or is likely to cause injury to her physical or mental health.

2. **Eugenic:** When the child is likely to be born with physical or mental abnormalities
3. **Humanitarian:** Where pregnancy is the result of rape.
4. **Socio-economic:** Where (actual or foreseeable) social or economic environments lead to a risk of injury to the health of the mother.
5. **Failure of contraceptive devices:** Unwanted pregnancy caused by the failure of any contraceptive method.

The written consent of the guardian is necessary i. in women below 18 years of age ii. in lunatics even if they are older than 18.

Persons who can perform abortion: A registered medical practitioner with one of the following qualifications can perform abortion, if pregnancy does not exceed 12 weeks.

- a) 6 months housemanship in obstetrics and gynaecology (OBG).
- b) a post-graduate qualification in OBG.
- c) 3 years experience in OBG for those doctors registered before the 1971 MTP Act was passed.
- d) 1 year practice in OBG for those doctors registered on or after the 1971 Act.
- e) If he/she has assisted a RMP in performing 25 cases of MTP in an approved institution.

Place where abortion can be performed:

1. A hospital established or maintained by the Government.
2. A place approved for the purpose by Government.
3. Non-governmental institutions which have obtained a license from the chief medical officer of the district.

Complications of abortions

1. **Immediate complications:** Maternal morality and morbidity
2. **Early complications:** Haemorrhage, shock, sepsis, uterine perforation, cervical injury and thromboembolism.
3. **Late Complications:** Infertility, ectopic pregnancy, spontaneous abortions and low birth weight babies.

MISCELLANEOUS METHODS

They include i. Behavioural methods ii. Natural Family Planning methods iii. Breast feeding iv. Birth control vaccine.

Behavioural methods: They are i. Abstinence, ii. Coitus interruptus, iii. Safe period.

- i. **Abstinence:** It is refraining from sexual intercourse. It is an impractical method since it is very difficult to suppress a natural desire.
- ii. **Coitus interruptus:** It means withdrawal of the penis before semen is ejaculated into the vagina.

Disadvantages:

1. Precoital secretion of the male may contain sperms and this is sufficient to cause pregnancy.
2. Slightest mistake in timing the withdrawal may lead to deposition of semen. So failure is likely to occur.
- iii) **Safe period** (Rhythm method): It is based on the fact that ovulation in females occurs. a) 14 days before the onset of next menstrual period or b) 13th day after the onset of present menstruation. A period of 3 days before and after this (roughly 10th to 20th day after the onset of menstruation) is taken

as the fertile period and it is not safe. This period must be avoided for sexual intercourse. The other days are safe for intercourse.

Disadvantages:

1. When menstrual cycle is irregular, safe period cannot be predicted.
2. It can be practiced only by educated and highly motivated couple.
3. Also it has a high failure rate.

Natural Family Planning Methods

They include i. Basal body temperature (BPT) ii. Cervical mucus method iii. Symptothermic method. These methods involve recognition of some physiological signs and symptoms associated with ovulation.

i. Basal body temperature method (BBT):

Due to the production of oestrogen, there is an increase of 0.3 to 0.5°C in BBT at the time of ovulation. The period during which there is an increase in BBT can be avoided for intercourse, since it is not safe.

ii. Cervical mucus method:

It is also known as "Billing's method" or "ovulation method". At the time of ovulation cervical mucus becomes watery clear (like raw egg white), smooth, slippery and profuse. This can be recognised and intercourse is avoided during this period.

iii. Symptothermic method

It combines BBT, cervical mucus and rhythm method. The principle is, if one sign fails, the other sign may help.

Breast feeding

It is generally believed that lactation prolongs post-partum amenorrhea and it can provide protection against pregnancy. But once menstruation returns, lactation does not protect against pregnancy.

Birth control vaccine:

A vaccine has been prepared from beta sub-unit of human chorionic gonadotropin (HCG). Immunisation with this vaccine blocks the continuation of pregnancy. Immunity can be boosted by a second injection.

✓ PERMANENT METHODS (Sterilisation)**Sterilisation (Terminal methods, Permanent methods):**

Sterilisation can be done for either males or females. The advantages of sterilisation are:

1. It is a one-time method
2. It does not require continued motivation
3. Complications are less if done properly
4. It is most cost-effective.

Guidelines for sterilisation: The guidelines issued by the Government for sterilisation are:

1. Age of husband should be above 25 years and less than 45 years.
2. Age of wife should be above 20 years and less than 45 years.
3. They must have 2 living children at the time of operation.
4. Lower limit of age of husband or wife can be relaxed, if the couple has 3 or more living children.
5. It is enough a. if the acceptor declares that he/she has obtained the consent of spouse without any force or pressure b. he/she knows that the

operation is irreversible c. the spouse has not been sterilised earlier.

Male sterilisation (Vasectomy)

In this method, a piece of vas deferens of about 1 cm length is removed after clamping. The ends are ligated and then folded back on themselves and sutured. Now, the cut ends face away from each other.

Advice after vasectomy

1. The patient should be told that he is not sterile immediately after operation. He is sterile only after 30 ejaculations.
2. He must use contraceptives till aspermia is established.
3. He must avoid cycling or lifting heavy weights for 15 days.

Complications of vasectomy

1. Operative complications like hematoma and infections.
2. Sperm granuloma accompanied by pain and swelling.
3. spontaneous recanalisation.
4. Psychological disturbances like loss of sexual vigour, impotence, fatigue etc.

Femalesterilisation

It is done by two procedures : 1. Laprascopy 2. Minilaprotomy

Laproscopy

It is done through abdominal approach with a specialised instrument called 'laprascope'. The abdomen is inflated with gas (carbon dioxide, nitrous oxide or air). Then the instrument is introduced into the abdominal cavity to

visualise the fallopian tubes. The tubes are occluded with fallop rings (or clips).

Advantages of laprascopy are short operating time, shorter stay in the hospital and a small scar. Rarely puncture of large blood vessels and other complications may occur.

Minilaprotomy

It is a modification of abdominal tubectomy. It is a very simple procedure done under local anaesthesia. It requires a very small abdominal incision of 2.5 to 3 cm in length. It is a safe, efficient and easy procedure with less complications.

✓ ROLE OF HEALTH EDUCATION IN FAMILY PLANNING

1. It can create an awareness in the community regarding the availability of various family planning services.
2. It can produce a positive attitude to family planning by motivating eligible couples to adopt the small family norm.
3. It allays fears and removes misconcepts about family planning.
4. It ensures that people utilise family planning progmmes optimally.
5. Health education efforts are directed at conducting orientation camps. These camps can motivate local

leaders to undertake activities at grass roots. So it can be made a movement of the people, by the people and for the people.

6. Health education also involves mass communication programmes through modern media (radio, TV and cinema) and cultural media (folk songs, puppet shows etc).

✓ **ROLE OF PHARMACIST IN FAMILY PLANNING**

Pharmacists work in various capacities throughout the country in most of the villages and towns. In most cases, pharmacists serve as a link between the public and the doctors. So it is likely that pharmacists come across a number of people with their own beliefs about family planning. The illiterate or less educated people are not aware of the benefits and also the ease of family planning. Most of them have a psychic fear that sterilisation is painful, dangerous and harmful to health. The pharmacist has a vital role to play in dispelling such fears.

Pharmacists can promote family planning by:

1. Displaying family planning posters in hospitals and drug stores.
2. Advising people about the importance of family planning, spacing of children etc.
3. By distributing pamphlets about family planning.
4. Explaining about oral contraceptives and family planning techniques.
5. Guiding people to hospitals and family planning centres for vasectomy or tubectomy.

Thus pharmacists can provide information, advice and motivation for family planning.