



NATIONAL OPEN UNIVERSITY OF NIGERIA

FACULTY OF HEALTH SCIENCES

COURSE CODE: EHS322

COURSE TITLE: REPRODUCTIVE HEALTH

**COURSE
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INTRODUCTION

EHS 322 titled “Reproductive Health” is a two (2) units course with four (4) Modules and twelve (12) Units. Reproductive health refers to the diseases, disorders and conditions that affect the functioning of the male and female reproductive systems during all stages of life. Disorders of reproduction include birth defects, developmental disorders, low birth weight, preterm birth, reduced fertility, impotence, and menstrual disorders.

A growing body of evidence suggests that exposure to endocrine disruptors, chemicals that appear to disrupt hormonal activity in humans and animals, may contribute to problems with fertility, pregnancy, and other aspects of reproduction.

Reproductive health could also be a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes. Reproductive health implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so.

WHAT YOU WILL LEARN IN THIS COURSE

In this course, you have the course units and a course guide. The course guide will tell you what the course is all about. It is general overview of the course materials you will be using and how to use those materials. It also helps you to allocate the appropriate time to each unit so that you can successfully complete the course within the stipulated time limit.

The course guide also helps you to know how to go about your Tutor-Marked Assignment which will form part of your overall assessment at the end of the course. Also, there will be regular tutorial classes that are related to this course, where you can interact with your facilitator and other students. Please, I encourage you to attend these tutorial classes.

COURSE AIMS

The course aims to give you an understanding on the concept of Reproductive Health.

COURSE OBJECTIVE

To achieve the aim set above, there are objectives. Each unit has a set of objectives presented at the beginning of the unit. These objectives will guide you on what to concentrate / focus on while studying the unit. Please read the objective before studying the unit and during your study to check your progress. The Comprehensive Objectives of the Course are given below. By the end of the course/after going through this course, you should be able to:

- Define the term concept of Reproductive Health

WORKING THROUGH THIS COURSE

To successfully complete this course, you are required to read each study unit, read the textbooks materials provided by the National Open University. Reading the referenced materials can also be of great assistance. Each unit has self-assessment exercises which you are advised to do and at certain periods during the course you will be required to submit your assignment for the purpose of assessment.

There will be a final examination at the end of the course. The course should take you about 17 weeks to complete. This course guide will provide you with all the components of the course how to go about studying and hour you should allocate your time to each unit so as to finish on time and successfully.

THE COURSE MATERIALS

The main components of the course are:

- The Study Guide
- Study Units
- Reference / Further Readings
- Assignments
- Presentation Schedule

STUDY UNIT

The study units in this course are given below:

Module 1 Public Aspects of Human Sexuality and Family Planning

- Unit 1 Definition of Reproductive Health
- Unit 2 Public Health
- Unit 3 Human Sexuality

Module 2 Family Planning

- Unit 1 Definition of Family Planning
- Unit 2 Human Resources
- Unit 3 Family Size Relationship

Module 3 Birth Control

- Unit 1 Meaning of Birth Control
- Unit 2 Facts about Birth Control
- Unit 3 Chorionic Villus Sampling

Module 4 Relationship Between Pregnancy And Diet

- Unit 1 Relationship between Pregnancy and Diet
- Unit 2 Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome (HIV/AIDS)
- Unit 3 Genetic Abnormalities

There are activities related to the lecture in each unit which will help your progress and comprehension of the unit. You are required to work on these exercises which together with the TMAs will enable you to achieve the objectives of each unit.

PRESENTATION SCHEDULE

There is a time-table prepared for the early and timely completion and submissions of your TMAs as well as attending the tutorial classes. You are required to submit all your assignments by the stipulated time and date. Avoid falling behind the schedule time.

ASSESSMENT

There are three aspects to the assessment of this course.

The first one is the self-assessment exercises. The second is the tutor marked assignments and the third is the written examination or the examination to be taken at the end of the course. Do the exercises or activities in the unit by applying the information and knowledge you acquired during the course. The tutor-marked assignments must be submitted to your facilitator for formal assessment in accordance with the deadlines stated in the presentation schedule and the assignment file.

The work submitted to your tutor for assessment will account for 30% of your total course work. At the end of this course, you have to sit for a final or end of course examination of about a three-hour duration which will account for 70% of your total course mark.

TUTOR-MARKED ASSIGNMENT

This is the continuous assessment component of this course and it accounts for 30% of the total score. You will be given four (3) TMAs by your facilitator to answer. Three of which must be answered before you are allowed to sit for the end of course examination.

These answered assignments are to be returned to your facilitator.

You're expected to complete the assignments by using the information and material in your readings references and study units. Reading and researching into your references will give you a wider view point and give you a deeper understanding of the subject.

1. Make sure that each assignment reaches your facilitator on or before the deadline given in the presentation schedule and assignment file. If for any reason you are not able to complete your assignment, make sure you contact your facilitator before the assignment is due to discuss the possibility of an extension. Request for extension will not be granted after the due date unless there are exceptional circumstances.
2. Make sure you revise the whole course content before sitting for the examination. The self-assessment activities and TMAs will be useful for this purpose and if you have any comment please do before the examination. The end of course examination covers information from all parts of the course.

COURSE MARKING SCHEME

Assignment	Marks
Assignments 1 – 3	Three assignments, each will count for 10% making a total of 30% of course marks.
End of course examination	70% of overall course marks
Total	100% of course materials.

FACILITATORS/TUTORS AND TUTORIALS

Sixteen (16) hours are provided for tutorials for this course. You will be notified of the dates, times and location for these tutorial classes. As soon as you are allocated a tutorial group, the name and phone number of your facilitator will be given to you. These are the duties of your facilitator: He or she will mark and comment on your assignment. He will monitor your progress and provide any necessary assistance you need. He or she will mark your TMAs and return to you as soon as possible.

(You are expected to mail your tutored assignment to your facilitator at least two days before the schedule date). Do not delay to contact your facilitator by telephone or e-mail for necessary assistance if you do not understand any part of the study in the course material. You have difficulty with the self-assessment activities. You have a problem or question with an assignment or with the grading of the assignment. It is important and necessary you acted the tutorial classes because this is the only chance to have face to face content with your facilitator and to ask questions which will be answered instantly. It is also period where you can mention any problem encountered in the course of your study.

SUMMARY

Reproductive health refers to the diseases, disorders and conditions that affect the functioning of the male and female reproductive systems during all stages of life. Disorders of reproduction include birth defects, developmental disorders, low birth weight, preterm birth, reduced fertility, impotence, and menstrual disorders. Research has shown that exposure to environmental pollutants may pose the greatest threat to reproductive health. Exposure to lead is associated with reduced fertility in both men and women, while mercury exposure has been linked to birth defects and neurological disorders. A growing body of evidence suggests that exposure to endocrine disruptors, chemicals that appear to disrupt hormonal activity

in humans and animals, may contribute to problems with fertility, pregnancy, and other aspects of reproduction.

By the end of this unit, you will be able to:

- explain the concept of reproductive health.

The list of questions expected to be answered is not limited to the above list. Finally, you are expected to apply the knowledge you have acquired during this course to your practical life.

I wish you success in this course.



**MAIN
COURSE**

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MODULE 1 REPRODUCTIVE HEALTH

Unit 1	Definition of Reproductive Health
Unit 2	Public Health
Unit 3	Human Sexuality

UNIT 1 DEFINITION OF REPRODUCTIVE HEALTH

CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Definition of Reproductive Health
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

I.0 INTRODUCTION

Reproductive health refers to the diseases, disorders and conditions that affect the functioning of the male and female reproductive systems during all stages of life. Disorders of reproduction include birth defects, developmental disorders, low birth weight, preterm birth, reduced fertility, impotence, and menstrual disorders. Research has shown that exposure to environmental pollutants may pose the greatest threat to reproductive health. Exposure to lead is associated with reduced fertility in both men and women, while mercury exposure has been linked to birth defects and neurological disorders. A growing body of evidence suggests that exposure to endocrine disruptors, chemicals that appear to disrupt hormonal activity in humans and animals, may contribute to problems with fertility, pregnancy, and other aspects of reproduction.

Reproductive health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and

processes. Reproductive health implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so.

2.0 OBJECTIVES

By the end of this unit, you will be able to:

- know the definition of reproductive health

3.0 MAIN CONTENT

3.1 Definition of reproductive health

Reproductive health is a state of complete physical, mental and social well-being, and not merely the absence of reproductive disease or infirmity. Reproductive health deals with the reproductive processes, functions and system at all stages of life. The International Conference on Population and Development Programme of Action states that "reproductive health ... implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so. Implicit in this last condition are the right of men and women to be informed and to have access to safe, effective, affordable and acceptable methods of family planning of their choice, as well as other methods of their choice for regulation of fertility which are not against the law, and the right of access to appropriate health care services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant.

Reproductive health includes sexual health, the purpose of which is the enhancement of life and personal relations, and not merely counselling and care related to reproduction and sexually transmitted diseases."

4.0 CONCLUSION

In this unit, you learnt about the definition of Reproductive health

5.0 SUMMARY

You have been *introduced to the field of Reproductive health. Reproductive health is a state of complete physical, mental and social well-being, and not merely the absence of reproductive disease or infirmity. Reproductive health deals with the reproductive processes, functions and system at all stages of life.*

The International Conference on Population and Development Programme of Action states that "reproductive health ... implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so. Implicit in this last condition are the right of men and women to be informed and to have access to safe, effective, affordable and acceptable methods of family planning of their choice, as well as other methods of their choice for regulation of fertility which are not against the law, and the right of access to appropriate health care services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant.

6.0 TUTOR-MARKED ASSIGNMENT

1. Define Reproductive health
2. List 5 disorders of reproduction.

Solution

1. Reproductive health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes. Reproductive health implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so.
2. Disorders of reproduction include birth defects, developmental disorders, low birth weight, preterm birth, reduced fertility, impotence, and menstrual disorders.

7.0 REFERENCES/FURTHER READING

Abdool Karim Q, Preston-Whyte E. and Abdool-Karim, S. S. (1992).

Teenagers seeking condoms at family planning services: Part I. A user's perspective. *South African Medical Journal*.82:356-59.

ACOG Committee Opinion (1992). Safety of oral contraceptives for teenagers. *International Journal of Gynecological Obstetrics*. 37:309-12.

UNIT 2 PUBLIC HEALTH

CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Definition of Public Health
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

Public health aims to improve the quality of life through prevention and treatment of disease, including mental health. This is done through the surveillance of cases and health indicators, and through the promotion of healthy behaviors.

2.0 OBJECTIVE

At the end of this course, students should be able to give proper definition of Public Health

3.0 MAIN CONTENT

3.1 Definition of Public Health

Public health has been defined as "the science and art of preventing disease, prolonging life and promoting human health through organized efforts and informed choices of society, organizations, public and private, communities and individuals". Analyzing the health of a population and the threats it faces is the basis for public health. The public can be as small as a handful of people or as large as a village or an entire city; in the case of a pandemic it may encompass several continents. The concept of health takes into account physical, psychological and social well-being. As such, according to the World Health Organization, it is not merely the absence of disease or infirmity. Public health is an interdisciplinary field. For example,

epidemiology, biostatistics and management of health services are all relevant. Other important subfields include environmental health, community health, behavioral health, health economics, public policy, mental health, occupational safety, gender issues in health, and sexual and reproductive health.

Public health aims to improve the quality of life through prevention and treatment of disease, including mental health. This is done through the surveillance of cases and health indicators, and through the promotion of healthy behaviors.

4.0 CONCLUSION

In this unit, you learnt about the definition of Public health

5.0 SUMMARY

Public health has been defined as "the science and art of preventing disease, prolonging life and promoting human health through organized efforts and informed choices of society, organizations, public and private, communities and individuals". Analyzing the health of a population and the threats it faces is the basis for public health. The public can be as small as a handful of people or as large as a village or an entire city; in the case of a pandemic it may encompass several continents.

6.0 TUTOR-MARKED ASSIGNMENT

1. Define public health.
2. What is the aim of public health?

Solution

1. Public health has been defined as "the science and art of preventing disease, prolonging life and promoting human health through organized efforts and informed choices of society, organizations, public and private, communities and individuals". Analyzing the health of a population and the threats it faces is the basis for public health. The public can be as small as a handful of people or as large as a village or an

entire city; in the case of a pandemic it may encompass several continents. The concept of health takes into account physical, psychological and social well-being. As such, according to the World Health Organization, it is not merely the absence of disease or infirmity. Public health is an interdisciplinary field.

2. Public health aim is to improve the quality of life through prevention and treatment of disease, including mental health. This is done through the surveillance of cases and health indicators, and through the promotion of healthy behaviors.

7.0 REFERENCES/FURTHER READING

Action with Youth -- HIV/AIDS and STD (2000): A Training Manual for Young People, Second Edition. Geneva: International Federation of Red Cross and Red Crescent Societies.

Adamchak S, and MacLaren L, (2000). Monitoring and Evaluating Adolescent Reproductive Health Programs. Washington, DC: FOCUS on Young Adults.

UNIT 3 HUMAN SEXUALITY

CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Meaning of Human Sexuality
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

The biological and physical aspects of sexuality largely concern the human reproductive functions, including the human sexual response cycle. Someone's sexual orientation can influence that person's sexual interest and attraction for another person. Physical and emotional aspects of sexuality include bonds between individuals that are expressed through profound feelings or physical manifestations of love, trust, and care.

2.0 OBJECTIVES

At the end of this unit, the student should be able to explain Human Sexuality.

3.0 MAIN CONTENT

3.1 Meaning of Human Sexuality

Human sexuality is the way people experience and express themselves sexually. This involves biological, erotic, physical, emotional, social, or spiritual feelings and behaviors. Because it is a broad term, which has varied over time, it lacks a precise definition. The biological and physical aspects of sexuality largely concern the human reproductive functions, including the human sexual response cycle. Someone's sexual orientation can influence that person's sexual interest and attraction for another person. Physical and emotional aspects of

sexuality include bonds between individuals that are expressed through profound feelings or physical manifestations of love, trust, and care. Social aspects deal with the effects of human society on one's sexuality, while spirituality concerns an individual's spiritual connection with others. Sexuality also affects and is affected by cultural, political, legal, philosophical, moral, ethical, and religious aspects of life.

Interest in sexual activity typically increases when an individual reaches puberty. Opinions differ on the origins of an individual's sexual orientation and sexual behavior. Some argue that sexuality is determined by genetics, while others believe it is molded by the environment, or that both of these factors interact to form the individual's sexual orientation. This pertains to the nature versus nurture debate. In the former, one assumes that the features of a person innately correspond to their natural inheritance, exemplified by drives and instincts; the latter refers to the assumption that the features of a person continue to change throughout their development and nurturing, exemplified by ego ideals and formative identifications.

4.0 CONCLUSION

In this unit you have learnt about sexuality in Human.

5.0 SUMMARY

Interest in sexual activity typically increases when an individual reaches puberty. Opinions differ on the origins of an individual's sexual orientation and sexual behavior. Some argue that sexuality is determined by genetics, while others believe it is molded by the environment, or that both of these factors interact to form the individual's sexual orientation. This pertains to the nature versus nurture debate. In the former, one assumes that the features of a person innately correspond to their natural inheritance, exemplified by drives and instincts; the latter refers to the assumption that the features of a person continue to change throughout their development and nurturing, exemplified by ego ideals and formative identifications.

6.0 TUTOR-MARKED ASSIGNMENT

1. Define Human Sexuality
2. At what age do one have high interest in sexual activities.

Solution

1. Human sexuality is the way people experience and express themselves sexually. This involves biological, erotic, physical, emotional, social, or spiritual feelings and behaviors. Because it is a broad term, which has varied over time, it lacks a precise definition. The biological and physical aspects of sexuality largely concern the human reproductive functions, including the human sexual response cycle. Someone's sexual orientation can influence that person's sexual interest and attraction for another person. Physical and emotional aspects of sexuality include bonds between individuals that are expressed through profound feelings or physical manifestations of love, trust, and care. Social aspects deal with the effects of human society on one's sexuality, while spirituality concerns an individual's spiritual connection with others. Sexuality also affects and is affected by cultural, political, legal, philosophical, moral, ethical, and religious aspects of life.
2. Interest in sexual activity typically increases when an individual reaches puberty. Opinions differ on the origins of an individual's sexual orientation and sexual behavior. Some argue that sexuality is determined by genetics, while others believe it is molded by the environment, or that both of these factors interact to form the individual's sexual orientation.

7.0 REFERENCES/FURTHER READING

Advancing Young Adult Reproductive Health (2001): Actions for the Next Decade. Washington, DC: FOCUS on Young Adults.

Alan Guttmacher Institute (1994). Sex and America's Teenagers. New York: The Alan Guttmacher Institute.

MODULE 2 FAMILY PLANNING

- Unit 1 Definition of family Planning
- Unit 2 Human Resources
- Unit 3 Family Size Relationship

UNIT 1 FAMILY PLANNING**CONTENT**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Meaning of Family Planning.
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

If sexually active, family planning may involve the use of contraception and other techniques to control the timing of reproduction. Family planning as defined by the United Nations and the World Health Organization encompasses services leading up to conception and does not promote abortion as a family planning method, although levels of contraceptive use reduce the need for abortion.

2.0 OBJECTIVES

At the end of this unit, a student should be able to explain Family Planning.

3.0 MAIN CONTENT

3.1 Definition of term

Family planning services are defined as "educational, comprehensive medical or social activities which enable individuals, including minors, to determine freely the number and spacing of their children and to select the means by which this may be achieved". Family planning may involve consideration of the number of children a woman wishes to have, including the choice to have no children, as well as the age at which she wishes to have them. These matters are influenced by external factors such as marital situation, career considerations, financial position, any disabilities that may affect their ability to have children and raise them, besides many other considerations. If sexually active, family planning may involve the use of contraception and other techniques to control the timing of reproduction. Family planning as defined by the United Nations and the World Health Organization encompasses services leading up to conception and does not promote abortion as a family planning method, although levels of contraceptive use reduce the need for abortion.

Family planning is sometimes used as a synonym or euphemism for access to and the use of contraception. However, it often involves methods and practices in addition to contraception. Additionally, there are many who might wish to use contraception but are not, necessarily, planning a family (e.g., unmarried adolescents, young married couples delaying childbearing while building a career); family planning has become a catch-all phrase for much of the work undertaken in this realm. Contemporary notions of family planning, however, tend to place a woman and her childbearing decisions at the center of the discussion, as notions of women's empowerment and reproductive autonomy have gained traction in many parts of the world. It is most usually applied to a female-male couple who wish to limit the number of children they have and/or to control the timing of pregnancy (also known as spacing children).

In 2006, the US Centers for Disease Control (CDC) issued a recommendation, encouraging men and women to formulate a reproductive life plan, to help them in avoiding unintended

pregnancies and to improve the health of women and reduce adverse pregnancy outcomes.

Raising a child requires significant amounts of resources: time, social, financial, and environmental. Planning can help assure that resources are available. The purpose of family planning is to make sure that any couple, man, or woman who has a child has the resources that are needed in order to complete this goal. With these resources a couple, man or woman can explore the options of natural birth, surrogacy, artificial insemination, or adoption. In the other case, if the person does not wish to have a child at the specific time, they can investigate the resources that are needed to prevent pregnancy, such as birth control, contraceptives, or physical protection and prevention.

4.0 CONCLUSION

In this unit, you learnt the meaning of Family Planning.

5.0 SUMMARY

Family planning is sometimes used as a synonym or euphemism for access to and the use of contraception. However, it often involves methods and practices in addition to contraception. Additionally, there are many who might wish to use contraception but are not, necessarily, planning a family (e.g., unmarried adolescents, young married couples delaying childbearing while building a career); family planning has become a catch-all phrase for much of the work undertaken in this realm. Contemporary notions of family planning, however, tend to place a woman and her childbearing decisions at the center of the discussion, as notions of women's empowerment and reproductive autonomy have gained traction in many parts of the world. It is most usually applied to a female-male couple who wish to limit the number of children they have and/or to control the timing of pregnancy (also known as spacing children).

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain Family Planning

Solution

1. *Family planning services are defined as "educational, comprehensive medical or social activities which enable individuals, including minors, to determine freely the number and spacing of their children and to select the means by which this may be achieved". Family planning may involve consideration of the number of children a woman wishes to have, including the choice to have no children, as well as the age at which she wishes to have them. These matters are influenced by external factors such as marital situation, career considerations, financial position, any disabilities that may affect their ability to have children and raise them, besides many other considerations. If sexually active, family planning may involve the use of contraception and other techniques to control the timing of reproduction.*

7.0 REFERENCES/FURTHER READING

Apter D, and Cacciatore R. (1993). Topical reviews: Alternative contraceptive choices for adolescents. *Fertility Control Review*.2(3):7-9.

Barker G, and Loewenstein I. Where The Boys Are: Promoting Greater Male Involvement in Sexuality Education: Conclusions from Qualitative Research in Rio de Janeiro, Brazil.

UNIT 2 HUMAN RESOURCES

CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Meaning of Human Resources
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

The field of health human resources deals with issues such as planning, development, performance, management, retention, information, and research on human resources for the health care sector. In recent years, raising awareness of the critical role of HRH in strengthening health system performance and improving population health outcomes has placed the health workforce high on the global health agenda.

2.0 OBJECTIVES

At the end of this unit, the student should be able to give a detail Explanation of Human resources.

3.0 MAIN CONTENT

human resources also known as human resources for health (HRH) or health workforce – is defined as "all people engaged in actions whose primary intent is to enhance health", according to the World Health Organization's World Health Report 2006. Human resources for health are identified as one of the core building blocks of a health system. They include physicians, nursing professionals, midwives, dentists, allied health professions, community health workers, social health workers and other health care providers, as well as health management and support personnel those who may not deliver

services directly but are essential to effective health system functioning, including health services managers, medical records and health information technicians, health economists, health supply chain managers, medical secretaries and others.

The field of health human resources deals with issues such as planning, development, performance, management, retention, information, and research on human resources for the health care sector. In recent years, raising awareness of the critical role of HRH in strengthening health system performance and improving population health outcomes has placed the health workforce high on the global health agenda.

4.0 CONCLUSION

In this unit you learnt, about Human resources in Nigeria.

5.0 SUMMARY

Human resources for health are identified as one of the core building blocks of a health system. They include physicians, nursing professionals, midwives, dentists, allied health professions, community health workers, social health workers and other health care providers, as well as health management and support personnel those who may not deliver services directly but are essential to effective health system functioning, including health services managers, medical records and health information technicians, health economists, health supply chain managers, medical secretaries and others.

6.0 TUTOR-MARKED ASSIGNMENT

Give a detail account of Human resources in Nigeria

Solution

Human resources also known as human resources for health (HRH) or health workforce – is defined as "all people engaged in actions whose primary intent is to enhance health", according to the World Health Organization's World Health Report 2006. Human resources for

health are identified as one of the core building blocks of a health system. They include physicians, nursing professionals, midwives, dentists, allied health professions, community health workers, social health workers and other health care providers, as well as health management and support personnel those who may not deliver services directly but are essential to effective health system functioning, including health services managers, medical records and health information technicians, health economists, health supply chain managers, medical secretaries and others.

The field of health human resources deals with issues such as planning, development, performance, management, retention, information, and research on human resources for the health care sector. In recent years, raising awareness of the critical role of HRH in strengthening health system performance and improving population health outcomes has placed the health workforce high on the global health agenda.

7.0 REFERENCES/FURTHER READING

Barker, and Mohamud, A. (1994). Adolescent Fertility and Adolescent Reproductive Health. Prepared for the United Nations Population Fund for the 1994 International Conference on Population and Development. Washington, DC: The Center for Population Options.

Barnett B, Katz K. Adolescent Reproductive Health: Navigating between Needs and Services.

UNIT 3 FAMILY SIZE RELATIONSHIP

CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Family size
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

Family size can also be differentiated from fertility, which reflects the aggregate numbers of births relative to the numbers of women in the population, without regard for the distribution of those births across family units. Fertility and family size are both important characteristics of cohorts; however, for assessing relationships at the individual level, family size or sibship size is the more meaningful construct.

2.0 OBJECTIVES

At the end of this unit, student should be able to explain family size

3.0 MAIN CONTENT

3.1 Family Size

Family size may be considered from two perspectives. At the individual (micro) level, it defines one aspect of an individual's family background or environment. As such, it represents a potential influence on the development and accomplishments of family members. At the societal (macro) level, family size is an indicator of societal structure that may vary over time, with concomitant implications for individual development and social relations in

different cohorts. In this essay, consideration is given to both aspects of family size, as it is reflected in sociological theory and research.

While the term family size is sometimes used to represent the total number of individuals comprising a family unit, Treas (1981) argues convincingly for decomposing the concept into two components: numbers of children and numbers of adults in the household. This distinction is important, as observed patterns of change in overall family size may be attributable to one component or the other, as may effects of overall family size. In the present discussion, family size is defined in terms of the number of children in the household.

A further distinction is made between family size in the parental and filial households, sometimes referred to as the family of origin (or orientation) and the family of procreation. Some use the term sibship size to refer to the number of children in an individual's parental family. However, the two are not directly comparable: Mean family size takes into account those families which have no children, while mean sibship size is necessarily restricted to families with children.

Family size can also be differentiated from fertility, which reflects the aggregate numbers of births relative to the numbers of women in the population, without regard for the distribution of those births across family units. Fertility and family size are both important characteristics of cohorts; however, for assessing relationships at the individual level, family size or sibship size is the more meaningful construct.

We have different aspects of family size: demographic trends in family size, antecedents and correlates of family size, and implications of sibship size and family size for child and adult members of the family.

4.0 CONCLUSION

In this unit you learnt about family size relationship.

5.0 SUMMARY

Family size can also be differentiated from fertility, which reflects the aggregate numbers of births relative to the numbers of women in the

population, without regard for the distribution of those births across family units. Fertility and family size are both important characteristics of cohorts; however, for assessing relationships at the individual level, family size or sibship size is the more meaningful construct. We have different aspects of family size: demographic trends in family size, antecedents and correlates of family size, and implications of sibship size and family size for child and adult members of the family.

6.0 TUTOR-MARKED ASSIGNMENT

Explain family size relationship

Solution

Family size may be considered from two perspectives. At the individual (micro) level, it defines one aspect of an individual's family background or environment. As such, it represents a potential influence on the development and accomplishments of family members. At the societal (macro) level, family size is an indicator of societal structure that may vary over time, with concomitant implications for individual development and social relations in different cohorts. In this essay, consideration is given to both aspects of family size, as it is reflected in sociological theory and research.

While the term family size is sometimes used to represent the total number of individuals comprising a family unit, Treas (1981) argues convincingly for decomposing the concept into two components: numbers of children and numbers of adults in the household. This distinction is important, as observed patterns of change in overall family size may be attributable to one component or the other, as may effects of overall family size. In the present discussion, family size is defined in terms of the number of children in the household.

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Family size can also be differentiated from fertility, which reflects the aggregate numbers of births relative to the numbers of women in the population, without regard for the distribution of those births across family units.

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MODULE 3 BIRTH CONTROL

- Unit 1 Meaning of Birth Control
- Unit 2 Facts about birth control
- Unit 3 Chorionic villus Sampling

UNIT 1 DEFINITION OF BIRTH CONTROL

CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Contents
 - 3.1 Meaning of Birth Control
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignments
- 7.0 Reference/Further Reading

1.0 INTRODUCTION

A range of devices and treatments are available for both men and women that can help prevent pregnancy. Some methods are more reliable than others. How well a method work often depends on how carefully it is used.

2.0 OBJECTIVES

At the end of this unit, students should be able to define Birth Control

3.0 MAIN CONTENT

3.1 Meaning of Birth Control

Birth control is the use of various devices, drugs, agents, sexual practices, or surgical procedures to prevent conception or pregnancy. It enables people to choose when they want to have a baby.

A range of devices and treatments are available for both men and women that can help prevent pregnancy. Some methods are more reliable than others. How well a method work often depends on how carefully it is used.

The contraceptive pill, for example, used correctly, is over 99 percent effective. However, because people make mistakes, as many as 9 women each year will become pregnant while using it. It gives the actual rates of effectiveness, which take into account the possibility of human error.

4.0 CONCLUSION

In this unit, students had learnt so far the meaning of birth control, and methods of birth control.

5.0 SUMMARY

Birth control is the use of various devices, drugs, agents, sexual practices, or surgical procedures to prevent conception or pregnancy. It enables people to choose when they want to have a baby.

6.0 TUTOR-MARKED ASSIGNMENTS

What is birth control?

Solution

Birth control is the use of various devices, drugs, agents, sexual practices, or surgical procedures to prevent conception or pregnancy. It enables people to choose when they want to have a baby. A range of devices and treatments are available for both men and women that can help prevent pregnancy. Some methods are more reliable than others. How well a method work often depends on how carefully it is used. The contraceptive pill, for example, used correctly, is over 99 percent effective. However, because people make mistakes, as many as 9 women each year will become pregnant while using it. It gives the actual rates of effectiveness, which take into account the possibility of human error.

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UNIT 2 FACTS ABOUT BIRTH CONTROL

CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Facts about Birth Control
 - 3.2 Prenatal care
 - 3.3 Perinatal care
 - 3.4 Postnatal care
 - 3.5 Amniocentesis
 - 3.6 Alpha-fetoprotein (ATP)
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

Birth control can help people decide when they want to have children. There are many types to choose from, including different types of barrier, medications, and traditional methods that need no additional resources. Effectiveness varies and often depends on how carefully the method is applied. Only a male condom offers any protection against sexually transmitted infections (STIs).

2.0 OBJECTIVES

At the end of this unit, students should be able to:

- State the fact about birth control
- Explain the following:
 - i. Prenatal care
 - ii. Perinatal care
 - iii. Amniocentesis

3.0 MAIN CONTENTS

3.1 Fact about birth control

- Birth control can help people decide when they want to have children.
- There are many types to choose from, including different types of barrier, medications, and traditional methods that need no additional resources.
- Effectiveness varies and often depends on how carefully the method is applied.
- Only a male condom offers any protection against sexually transmitted infections (STIs).

3.2 Prenatal care

Prenatal care is when you get checkups from a doctor, nurse, or midwife throughout your pregnancy it helps keep you and your future baby healthy. Prenatal care is an important part of staying healthy during pregnancy. Doctors, nurses, or midwife will monitor your future baby's development and do routine testing to help find and prevent possible problems. These regular checkups are also a great time to learn how to ease any discomfort you may be having, and ask any other questions about your pregnancy and the birth of your future baby.

3.3 Perinatal care

The perinatal period is defined in diverse ways. Depending on the definition, it starts at the 20th to 28th week of gestation and ends 1 to 4 weeks after birth. The perinatal period commences at 22 completed weeks (154 days) of gestation and ends seven completed days after birth. Perinatal and maternal health are closely linked. Perinatal mortality refers to the number of stillbirths and deaths in the first week of life (early neonatal mortality).

In 2009 there were 2.6 million stillbirths globally with more than 8200 deaths a day. At least half of all stillbirths occurred in the intrapartum period. Among the 133 million babies born alive each year, 2.8 million die in the first week of life. The patterns of these deaths are

similar to the patterns for maternal deaths; the majority occurring in developing countries. Quality skilled care during pregnancy and childbirth are key for the health of the baby and the mother. WHO is supporting countries in delivering integrated, evidence-based and cost-effective care for mothers and babies that begins before conception and goes through pregnancy, childbirth and the postpartum period.

3.4 Postnatal care

A postpartum (or postnatal) period begins immediately after the birth of a child as the mother's body, including hormone levels and uterus size, returns to a non-pregnant state. The terms puerperium or puerperal period, or immediate postpartum period are commonly used to refer to the first six weeks following childbirth. The World Health Organization (WHO) describes the postnatal period as the most critical and yet the most neglected phase in the lives of mothers and babies; most maternal and newborn deaths occur during the postnatal period. In scientific literature, the term is commonly abbreviated to Px, where x is a number; for example, "day P5" should be read as "the fifth day after birth". This is not to be confused with the medical nomenclature that uses G P to stand for number and outcomes of pregnancy (gravidity and parity).

A woman giving birth in a hospital may leave as soon as she is medically stable, which can be as early as a few hours postpartum, though the average for a vaginal birth is one to two days. The average caesarean section postnatal stay is three to four days. During this time, the mother is monitored for bleeding, bowel and bladder function, and baby care. The infant's health is also monitored. [5] Early postnatal hospital discharge is typically defined as discharge of the mother and newborn from the hospital within 48 hours of birth.

The postpartum period can be divided into three distinct stages; the initial or acute phase, 6–12 hours after childbirth; subacute postpartum period, which lasts 2–6 weeks, and the delayed postpartum period, which can last up to six months. In the subacute postpartum period, 87% to 94% of women report at least one health problem. Long-term health problems (persisting after the delayed postpartum period) are reported by 31% of women.

3.5 Amniocentesis

Amniocentesis (also referred to as amniotic fluid test) is a medical procedure used in prenatal diagnosis of chromosomal abnormalities and fetal infections, and also for sex determination, in which a small amount of amniotic fluid, which contains fetal tissues, is sampled from the amniotic sac surrounding a developing fetus, and then the fetal DNA is examined for genetic abnormalities. The most common reason to have an "amnio" is to determine whether a fetus has certain genetic disorders or a chromosomal abnormality, such as Down syndrome. Amniocentesis (or another procedure, called chorionic villus sampling (CVS)) can diagnose these problems in the womb. Amniocentesis is performed when a woman is between 14 and 16 weeks' gestation. Women who choose to have this test are primarily those at increased risk for genetic and chromosomal problems, in part because the test is invasive and carries a small risk of miscarriage. This process can be used for prenatal sex discernment and hence this procedure has legal restrictions in some countries. Several researchers worked on the development of amniocentesis for fetal sex determination in the 1950s. For example, Robert Lisle Gadd developed the new technique of amniocentesis for clinical assessment of fetal wellbeing in utero. He presented his results at the William Blair-Bell Memorial Lecture at the RCOG in London in 1965 and was awarded an MD from the University of Manchester for this work. He also described amniocentesis techniques, as well as other details about amniotic fluids.

Up to the mid-1970s amniocentesis procedures were done 'blind'. Doctors Jens Bang and Allen Northved from Denmark were the first to report amniocentesis done with the guide of an ultrasound in 1972. Chorionic villus sampling (CVS) was first performed by Italian biologist Giuseppe Simoni in 1983. Real-time ultrasound is now used during all invasive procedures because it provides for the safety of the fetus and accuracy of results.

3.6 Alpha-Fetoprotein (AFP)

Alpha-fetoprotein (AFP, α -fetoprotein; also sometimes called alpha-1-fetoprotein, alpha-fetoglobulin, or alpha fetal protein) is a protein that

in humans is encoded by the AFP gene. The AFP gene is located on the q arm of chromosome 4 (4q25).

AFP is a major plasma protein produced by the yolk sac and the fetal liver during fetal development. It is thought to be the fetal analog of serum albumin. AFP binds to copper, nickel, fatty acids and bilirubin and is found in monomeric, dimeric and trimeric forms. AFP is a glycoprotein of 591 amino acids and a carbohydrate moiety.

AFP is the most abundant plasma protein found in the human fetus. Maternal plasma levels peak near the end of the first trimester, and begin decreasing prenatally at that time, then decrease rapidly after birth. Normal adult levels are usually achieved by the age of 8 to 12 months. The function of AFP in adult humans is unknown; however, in rodents it binds estradiol to prevent the transport of this hormone across the placenta to the fetus. The main function of this is to prevent the virilization of female fetuses. As human AFP does not bind estrogen, its function in humans is less clear.

The rodent AFP system can be overridden with massive injections of estrogen, which overwhelm the AFP system and will masculinize the fetus. The masculinizing effect of estrogens may seem counter-intuitive since estrogens are critical for the proper development of female secondary characteristics during puberty. However, this is not the case prenatally. Gonadal hormones from the testes, such as testosterone and antimullerian hormone are required to cause development of a phenotypic male. Without these hormones the fetus will develop into a phenotypic female even if genetically XY. The conversion of testosterone into estradiol by aromatase in many tissues may be an important step in masculinization of that tissue. Masculinization of the brain is thought to occur both by conversion of testosterone into estradiol by aromatase, but also by de novo synthesis of estrogens within the brain. Thus, AFP may protect the fetus from maternal estradiol that would otherwise have a masculinizing effect on the fetus, but its exact role is still controversial.

4.0 CONCLUSION

Students have learnt about the facts of birth control, prenatal care, perinatal care, postnatal care and amniocentesis.

5.0 SUMMARY

Up to the mid-1970s amniocentesis procedures were done 'blind'. Doctors Jens Bang and Allen Northved from Denmark were the first to report amniocentesis done with the guide of an ultrasound in 1972. Chorionic villus sampling (CVS) was first performed by Italian biologist Giuseppe Simoni in 1983. Real-time ultrasound is now used during all invasive procedures because it provides for the safety of the fetus and accuracy of results.

6.0 TUTOR-MARKED ASSIGNMENTS

1. State the fact about birth control.
2. What is Prenatal care?
3. What is amniocentesis?

Solution

1 state the facts about birth control

- Birth control can help people decide when they want to have children.
- There are many types to choose from, including different types of barrier, medications, and traditional methods that need no additional resources.
- Effectiveness varies and often depends on how carefully the method is applied.
- Only a male condom offers any protection against sexually transmitted infections (STIs).

2. What is Prenatal care?

Prenatal care is when you get checkups from a doctor, nurse, or midwife throughout your pregnancy it helps keep you and your future baby healthy. Prenatal care is an important part of staying healthy during pregnancy. Your doctor, nurse, or midwife will monitor your future baby's development and do routine testing to help find and prevent possible problems. These regular checkups are also a great time to learn how to ease any discomfort you may be having, and ask any other

questions about your pregnancy and the birth of your future baby.

3. What is amniocentesis?

Amniocentesis (also referred to as amniotic fluid test) is a medical procedure used in prenatal diagnosis of chromosomal abnormalities and fetal infections, and also for sex determination, in which a small amount of amniotic fluid, which contains fetal tissues, is sampled from the amniotic sac surrounding a developing fetus, and then the fetal DNA is examined for genetic abnormalities. The most common reason to have an "amnio" is to determine whether a fetus has certain genetic disorders or a chromosomal abnormality, such as Down syndrome. Amniocentesis (or another procedure, called chorionic villus sampling (CVS)) can diagnose these problems in the womb. Amniocentesis is performed when a woman is between 14 and 16 weeks' gestation.

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UNIT 3 CHLORIONIC VILLUS SAMPLING (CVS)

CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Chorionic Villus Sampling
 - 3.2 Percutaneous Umbilical Cord Blood Sampling (PUBS)
 - 3.3 Magnetic Resonance Imaging (MRI)
 - 3.4 A Non-Stress Test (NST)
 - 3.5 Ultrasonography
 - 3.6 Hematological Test
 - 3.7 Fetoscopy
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

The risk of miscarriage in CVS is estimated to be potentially as high as 1-2%. However, some recent research has suggested that only a very small number of miscarriages that occur after CVS are a direct result of the procedure. [8] Apart from a risk of miscarriage, there is a risk of infection and amniotic fluid leakage. The resulting amniotic fluid leak can develop into a condition known as oligohydramnios, which is low amniotic fluid level. If the resulting oligohydramnios is not treated and the amniotic fluid continues to leak it can result in the baby developing hypoplastic lungs (underdeveloped lungs)

2.0 OBJECTIVES

At the end of this unit, students should be able to have an insight to what is Chorionic Villus Sampling, magnetic resonance imaging, Ultrasonography, Hematological Test

3.0 MAIN CONTENTS

3.1 Chorionic Villus Sampling (CVS)

Chorionic villus sampling (CVS), sometimes called "chorionic villous sampling" (as "villous" is the adjectival form of the word "villus"), is a form of prenatal diagnosis to determine chromosomal or genetic disorders in the fetus. It entails sampling of the chorionic villus (placental tissue) and testing it for chromosomal abnormalities, usually with FISH or PCR. CVS usually takes place at 10–12 weeks' gestation, earlier than amniocentesis or percutaneous umbilical cord blood sampling. It is the preferred technique before 15 weeks. CVS was performed for the first time in Milan by Italian biologist Giuseppe Simoni, scientific director of Biocell Center, in 1983. Use as early as 8 weeks in special circumstances has been described. It can be performed in a trans-cervical or trans-abdominal manner.

Although this procedure is mostly associated with testing for Down syndrome, overall, CVS can detect more than 200 disorders.

Possible reasons for having a CVS can include:

- Abnormal first trimester screen results
- Increased nuchal translucency or other abnormal ultrasound findings
- Family history of a chromosomal abnormality or other genetic disorder
- Parents are known carriers for a genetic disorder
- Advanced maternal age (maternal age above 35). AMA is associated with increased risk of Down's syndrome and at age 35, risk is 1:400. Screening tests are usually carried out first before deciding if CVS should be done.

The risk of miscarriage in CVS is estimated to be potentially as high as 1-2%. However, some recent research has suggested that only a very small number of miscarriages that occur after CVS are a direct result of the procedure. [8] Apart from a risk of miscarriage, there is a risk of infection and amniotic fluid leakage. The resulting amniotic fluid leak can develop into a condition known as oligohydramnios, which is low amniotic fluid level. If the resulting oligohydramnios is not treated and the amniotic fluid continues to leak it can result in the

baby developing hypoplastic lungs (underdeveloped lungs). Additionally, there is also mild risk of Limb Reduction Defects associated with CVS, with the risk being higher the earlier the procedure is carried. It is important after having CVS that the obstetrician follows the patient closely to ensure the patient does not develop infection.

3.2 Percutaneous Umbilical Cord Blood Sampling (Pubs)

Percutaneous umbilical cord blood sampling (PUBS), also called cordocentesis, fetal blood sampling, or umbilical vein sampling is a diagnostic genetic test that examines blood from the fetal umbilical cord to detect fetal abnormalities. Fetal and maternal blood supplies are typically connected in utero with one vein and two arteries to the fetus. The umbilical vein is responsible for delivering oxygen rich blood to the fetus from the mother; the umbilical arteries are responsible for removing oxygen poor blood from the fetus. This allows for the fetus' tissues to properly perfuse. PUBS provides a means of rapid chromosome analysis and is useful when information cannot be obtained through amniocentesis, chorionic villus sampling, or ultrasound (or if the results of these tests were inconclusive); this test carries a significant risk of complication and is typically reserved for pregnancies determined to be at high risk for genetic defect. It has been used with mothers with immune thrombocytopenic purpura.

If the fetus is viable, the procedure is performed close to an operating room in case an emergency cesarean section is necessary due to complications caused by the procedure. Currently, there is no definite age of viability because this depends on the fetus' ability to survive outside the womb, which in cases of premature births, can depend on access to medical care and technology needed to keep the fetus alive through the neonatal stage.

Prenatal care is when you get checkups from a doctor, nurse, or midwife throughout your pregnancy it helps keep you and your future baby healthy.

3.3 Magnetic Resonance Imaging (Mri)

Magnetic resonance imaging (MRI) is a medical imaging technique used in radiology to form pictures of the anatomy and the physiological processes of the body. MRI scanners use strong magnetic fields, magnetic field gradients, and radio waves to generate images of the organs in the body. MRI does not involve X-rays or the use of ionizing radiation, which distinguishes it from CT or CAT scans and PET scans. Magnetic resonance imaging is a medical application of nuclear magnetic resonance (NMR). NMR can also be used for imaging in other NMR applications such as NMR spectroscopy.

While the hazards of X-rays are now well controlled in most medical contexts, an MRI scan may still be seen as a better choice than a CT scan. MRI is widely used in hospitals and clinics for medical diagnosis, staging of disease and follow-up without exposing the body to radiation. An MRI may yield different information compared with CT. There may be risks and discomfort associated with MRI scans. Compared with CT scans, MRI scans typically take longer and are louder, and they usually need the subject to enter a narrow, confining tube. In addition, people with some medical implants or other non-removable metal inside the body may be unable to undergo an MRI examination safely.

MRI was originally called NMRI (nuclear magnetic resonance imaging), but "nuclear" was dropped to avoid negative associations. Certain atomic nuclei are able to absorb and emit radio frequency energy when placed in an external magnetic field. In clinical and research MRI, hydrogen atoms are most often used to generate a detectable radio-frequency signal that is received by antennas in close proximity to the anatomy being examined. Hydrogen atoms are naturally abundant in people and other biological organisms, particularly in water and fat. For this reason, most MRI scans essentially map the location of water and fat in the body. Pulses of radio waves excite the nuclear spin energy transition, and magnetic field gradients localize the signal in space. By varying the parameters of the pulse sequence, different contrasts may be generated between tissues based on the relaxation properties of the hydrogen atoms therein.

3.4 A Non-Stress Test (Nst)

A non-stress test (NST) is a screening test used in pregnancy used to assess fetal status by means of the fetal heart rate and its responsiveness. A cardiotocograph is used to monitor the fetal heart rate and presence or absence of uterine contractions. The test is typically termed "reactive" (also "reassuring") or "nonreactive" (also "non-reassuring").

A non-stress test can be classified as normal, atypical, or abnormal. A normal non-stress test will show a baseline fetal heart rate between 110 and 160 beats per minute with moderate variability (5- to 25-interbeat variability) and 2 qualifying accelerations in 20 minutes with no decelerations.

"Reactive" is defined as the presence of two or more fetal heart rate accelerations within a 20-minute period. Each acceleration must increase the heart rate 15 beats per minute above the baseline rate, and last for at least 15 seconds when the fetus is above 32 weeks' gestation, or 10 beats per minute over 10 seconds when the fetus is at or below 32 weeks' gestation.

"Non-reactive" is defined as fewer than two adequate accelerations during a prolonged period, which may be over an hour.

3.5 Ultrasonography

Ultrasonography uses high-frequency sound (ultrasound) waves to produce images of internal organs and other tissues. A device called a transducer converts electrical current into sound waves, which are sent into the body's tissues. Sound waves bounce off structures in the body and are reflected back to the transducer, which converts the waves into electrical signals. A computer converts the pattern of electrical signals into an image, which is displayed on a monitor and recorded on film, on videotape, or as a digital computer image. No x-rays are used.

3.6 Hematological Test

Hematology is the study of blood and blood disorders. Hematologists and hematopathologists are highly trained healthcare providers who specialize in diseases of the blood and blood components. These include blood and bone marrow cells. Hematological tests can help diagnose anemia, infection, hemophilia, blood-clotting disorders, and leukemia.

3.7 Fetoscopy

Fetoscopy is an endoscopic procedure during pregnancy to allow surgical access to the fetus, the amniotic cavity, the umbilical cord, and the fetal side of the placenta. A small (3–4 mm) incision is made in the abdomen, and an endoscope is inserted through the abdominal wall and uterus into the amniotic cavity. Fetoscopy allows for medical interventions such as a biopsy (tissue sample) or a laser occlusion of abnormal blood vessels (such as chorioangioma) or the treatment of spina bifida.

Fetoscopy is usually performed in the second or third trimester of pregnancy. The procedure can place the fetus at increased risk of adverse outcomes, including fetal loss or preterm delivery, so the risks and benefits must be carefully weighed in order to protect the health of the mother and fetus(es). The procedure is typically performed in an operating room by an obstetrician-gynecologist.

4.0 CONCLUSION

Students have learnt the following,

- i. Chlorionic villus sampling
- ii. Percutaneous Umbilical Cord Blood Sampling
- iii. Magnetic Resonance Imaging
- iv. A non-Stress Test

5.0 SUMMARY

Magnetic resonance imaging (MRI) is a medical imaging technique used in radiology to form pictures of the anatomy and the

physiological processes of the body. MRI scanners use strong magnetic fields, magnetic field gradients, and radio waves to generate images of the organs in the body. MRI does not involve X-rays or the use of ionizing radiation, which distinguishes it from CT or CAT scans and PET scans. Magnetic resonance imaging is a medical application of nuclear magnetic resonance (NMR). NMR can also be used for imaging in other NMR applications such as NMR spectroscopy.

6.0 TUTOR-MARKED ASSIGNMENTS

Explain the following:

1. Chorionic villus sampling
2. Magnetic Resonance Imaging

Solution

1. Chorionic villus sampling (CVS), sometimes called "chorionic villous sampling" (as "villous" is the adjectival form of the word "villus"), is a form of prenatal diagnosis to determine chromosomal or genetic disorders in the fetus. It entails sampling of the chorionic villus (placental tissue) and testing it for chromosomal abnormalities, usually with FISH or PCR. CVS usually takes place at 10–12 weeks' gestation, earlier than amniocentesis or percutaneous umbilical cord blood sampling. It is the preferred technique before 15 weeks. CVS was performed for the first time in Milan by Italian biologist Giuseppe Simoni, scientific director of Biocell Center, in 1983. Use as early as 8 weeks in special circumstances has been described. It can be performed in a trans-cervical or trans-abdominal manner.

Although this procedure is mostly associated with testing for Down syndrome, overall, CVS can detect more than 200 disorders.

2. Magnetic resonance imaging (MRI) is a medical imaging technique used in radiology to form pictures of the anatomy and the physiological processes of the body. MRI scanners use

strong magnetic fields, magnetic field gradients, and radio waves to generate images of the organs in the body. MRI does not involve X-rays or the use of ionizing radiation, which distinguishes it from CT or CAT scans and PET scans. Magnetic resonance imaging is a medical application of nuclear magnetic resonance (NMR). NMR can also be used for imaging in other NMR applications such as NMR spectroscopy.

While the hazards of X-rays are now well controlled in most medical contexts, an MRI scan may still be seen as a better choice than a CT scan. MRI is widely used in hospitals and clinics for medical diagnosis, staging of disease and follow-up without exposing the body to radiation. An MRI may yield different information compared with CT. There may be risks and discomfort associated with MRI scans. Compared with CT scans, MRI scans typically take longer and are louder, and they usually need the subject to enter a narrow, confining tube. In addition, people with some medical implants or other non-removable metal inside the body may be unable to undergo an MRI examination safely.

MRI was originally called NMRI (nuclear magnetic resonance imaging), but "nuclear" was dropped to avoid negative associations. Certain atomic nuclei are able to absorb and emit radio frequency energy when placed in an external magnetic field. In clinical and research MRI, hydrogen atoms are most often used to generate a detectable radio-frequency signal that is received by antennas in close proximity to the anatomy being examined.

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MODULE 4 RELATIONSHIP BETWEEN PREGNANCY AND DIET

- Unit 1 Relationship between Pregnancy and Diet
- Unit 2 Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome (HIV/AIDS)
- Unit 3 Genetic Abnormalities

UNIT 1 RELATIONSHIP BETWEEN PREGNANCY AND DIET

CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main content
 - 3.1 Relationship between pregnancy and Diet
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

To support these adjustments, the use of nutrients from the diet may be altered either by increasing intestinal absorption or by reducing excretion via the kidney or gastrointestinal tract. These adjustments in nutrient metabolism are complex and evolve continuously throughout pregnancy. The changes in nutrient metabolism can be described by several general concepts: adjustments in nutrient metabolism are driven by hormonal changes, fetal demands, and maternal nutrient supply; more than one potential adjustment exists for each nutrient; maternal behavioral changes augment physiologic adjustments; and a limit exists in the physiologic capacity to adjust nutrient metabolism to meet pregnancy needs, which when exceeded, fetal growth and development are impaired.

2.0 OBJECTIVES

At the end of this unit students should be able to explain these

1. Relationship between Pregnancy and Diet
2. Sleep
3. Exercise
4. Smoking Cigarette

3.0 MAIN CONTENT

3.1 Relationship Between Pregnancy and Diet

Pregnancy is a dynamic, anabolic state. Within several weeks of conception, a new endocrine organ, the placenta, is already formed and is secreting hormones that affect the metabolism of all nutrients. These adjustments in nutrient metabolism, in addition to changes in the anatomy and physiology of the mother, support fetal growth and development while maintaining maternal homeostasis and preparing for lactation. Depending on the nutrient, one or more of the following adjustments occur: 1) accretion in new tissue or deposition in maternal stores, 2) redistribution among tissues, and 3) increased turnover or rate of metabolism.

To support these adjustments, the use of nutrients from the diet may be altered either by increasing intestinal absorption or by reducing excretion via the kidney or gastrointestinal tract. These adjustments in nutrient metabolism are complex and evolve continuously throughout pregnancy. The changes in nutrient metabolism can be described by several general concepts: adjustments in nutrient metabolism are driven by hormonal changes, fetal demands, and maternal nutrient supply; more than one potential adjustment exists for each nutrient; maternal behavioral changes augment physiologic adjustments; and a limit exists in the physiologic capacity to adjust nutrient metabolism to meet pregnancy needs, which when exceeded, fetal growth and development are impaired.

3.2 Sleep

Sleep is a naturally recurring state of mind and body, characterized by altered consciousness, relatively inhibited sensory activity, inhibition of nearly all voluntary muscles, and reduced interactions with surroundings. [1] It is distinguished from wakefulness by a decreased ability to react to

stimuli, but more reactive than coma or disorders of consciousness, sleep displaying very different and active brain patterns.

Sleep occurs in repeating periods, in which the body alternates between two distinct modes: REM sleep and non-REM sleep. Although REM stands for "rapid eye movement", this mode of sleep has many other aspects, including virtual paralysis of the body. A well-known feature of sleep is the dream, an experience typically recounted in narrative form, which resembles waking life while in progress, but which usually can later be distinguished as fantasy.

During sleep, most of the body's systems are in an anabolic state, helping to restore the immune, nervous, skeletal, and muscular systems; these are vital processes that maintain mood, memory, and cognitive function, and play a large role in the function of the endocrine and immune systems. The internal circadian clock promotes sleep daily at night. The diverse purposes and mechanisms of sleep are the subject of substantial ongoing research. Sleep is a highly conserved behavior across animal evolution.

Humans may suffer from various sleep disorders, including dyssomnias such as insomnia, hypersomnia, narcolepsy, and sleep apnea; parasomnias such as sleepwalking and REM behavior disorder; bruxism; and circadian rhythm sleep disorders. The advent of artificial light has substantially altered sleep timing in industrialized countries.

The most pronounced physiological changes in sleep occur in the brain. The brain uses significantly less energy during sleep than it does when awake, especially during non-REM sleep. In areas with reduced activity, the brain restores its supply of adenosine triphosphate (ATP), the molecule used for short-term storage and transport of energy. In quiet waking, the brain is responsible for 20% of the body's energy use, thus this reduction has a noticeable effect on overall energy consumption.

Sleep increases the sensory threshold. In other words, sleeping persons perceive fewer stimuli, but can generally still respond to loud noises and other salient sensory events.

3.2.1 Non-Rem and Rem Sleep

Sleep is divided into two broad types: non-rapid eye movement (non-REM or NREM) sleep and rapid eye movement (REM) sleep. Non-REM and REM sleep are so different that physiologists identify them as distinct behavioral states. Non-REM sleep occurs first and after a transitional

period is called slow-wave sleep or deep sleep. During this phase, body temperature and heart rate fall, and the brain uses less energy. REM sleep, also known as paradoxical sleep, represents a smaller portion of total sleep time. It is the main occasion for dreams (or nightmares), and is associated with desynchronized and fast brain waves, eye movements, loss of muscle tone, [1] and suspension of homeostasis.

The sleep cycle of alternate NREM and REM sleep takes an average of 90 minutes, occurring 4–6 times in a good night's sleep. The American Academy of Sleep Medicine (AASM) divides NREM into three stages: N1, N2, and N3, the last of which is also called delta sleep or slow-wave sleep. The whole period normally proceeds in the order: N1 → N2 → N3 → N2 → REM. REM sleep occurs as a person returns to stage 2 or 1 from a deep sleep. There is a greater amount of deep sleep (stage N3) earlier in the night, while the proportion of REM sleep increases in the two cycles just before natural awakening.

3.3 Exercise

Exercise is any bodily activity that enhances or maintains physical fitness and overall health and wellness. It is performed for various reasons, to aid growth and improve strength, preventing aging, developing muscles and the cardiovascular system, honing athletic skills, weight loss or maintenance, improving health and also for enjoyment. Many individuals choose to exercise outdoors where they can congregate in groups, socialize, and enhance well-being

Physical exercises are generally grouped into three types, depending on the overall effect they have on the human body:

- Aerobic exercise is any physical activity that uses large muscle groups and causes the body to use more oxygen than it would while resting. The goal of aerobic exercise is to increase cardiovascular endurance. Examples of aerobic exercise include running, cycling, swimming, brisk walking, skipping rope, rowing, hiking, dancing, playing tennis, continuous training, and long distance running.
- Anaerobic exercise, which includes strength and resistance training, can firm, strengthen, and increase muscle mass, as well as improve bone density, balance, and coordination. [4] Examples of strength exercises are push-ups, pull-ups, lunges, squats, bench press. Anaerobic exercise also includes weight training, functional training, eccentric training, interval training, sprinting, and high-intensity interval training increase short-term muscle strength.

- Flexibility exercises stretch and lengthen muscles. Activities such as stretching help to improve joint flexibility and keep muscles limber. The goal is to improve the range of motion which can reduce the chance of injury.

Physical exercise can also include training that focuses on accuracy, agility, power, and speed.

Sometimes the terms 'dynamic' and 'static' are used. 'Dynamic' exercises such as steady running, tend to produce a lowering of the diastolic blood pressure during exercise, due to the improved blood flow. Conversely, static exercise (such as weight-lifting) can cause the systolic pressure to rise significantly, albeit transiently, during the performance of the exercise.

3.4 Smoking Cigarette

Smoking is a practice in which a substance is burned and the resulting smoke breathed in to be tasted and absorbed into the bloodstream. Most commonly, the substance used is the dried leaves of the tobacco plant, which have been rolled into a small square of rice paper to create a small, round cylinder called a "cigarette". Smoking is primarily practiced as a route of administration for recreational drug use because the combustion of the dried plant leaves vaporizes and delivers active substances into the lungs where they are rapidly absorbed into the bloodstream and reach bodily tissue. In the case of cigarette smoking these substances are contained in a mixture of aerosol particles and gasses and include the pharmacologically active alkaloid nicotine; the vaporization creates heated aerosol and gas into a form that allows inhalation and deep penetration into the lungs where absorption into the bloodstream of the active substances occurs. In some cultures, smoking is also carried out as a part of various rituals, where participants use it to help induce trance-like states that, they believe, can lead them to spiritual enlightenment.

Smoking generally has negative health effects, because smoke inhalation inherently poses challenges to various physiologic processes such as respiration. Diseases related to tobacco smoking have been shown to kill approximately half of long-term smokers when compared to average mortality rates faced by non-smokers. Smoking caused over five million deaths a year from 1990 to 2015.

Smoking is one of the most common forms of recreational drug use. Tobacco smoking is the most popular form, being practiced by over one

billion people globally, of whom the majority are in the developing countries.

3.5 Alcohol

In chemistry, an alcohol is any organic compound in which the hydroxyl functional group (-OH) is bound to a carbon. The term alcohol originally referred to the primary alcohol ethanol (ethyl alcohol), which is used as a drug and is the main alcohol present in alcoholic beverages. An important class of alcohols, of which methanol and ethanol are the simplest members, includes all compounds for which the general formula is $\text{C}_n\text{H}_{2n+1}\text{OH}$.

The suffix -ol appears in the IUPAC chemical name of all substances where the hydroxyl group is the functional group with the highest priority. When a higher priority group is present in the compound, the prefix hydroxy- is used in its IUPAC name. The suffix -ol in non-IUPAC names (such as paracetamol or cholesterol) also typically indicates that the substance is an alcohol. However, many substances that contain hydroxyl functional groups (particularly sugars, such as glucose and sucrose) have names which include neither the suffix -ol , nor the prefix hydroxy-. Systematic names IUPAC nomenclature is used in scientific publications and where precise identification of the substance is important, especially in cases where the relative complexity of the molecule does not make such a systematic name unwieldy. In naming simple alcohols, the name of the alkane chain loses the terminal e and adds the suffix -ol , e.g., as in "ethanol" from the alkane chain name "ethane". [17] When necessary, the position of the hydroxyl group is indicated by a number between the alkane name and the -ol :
propan-1-ol for $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$

$\text{3CH}_2\text{OH}$

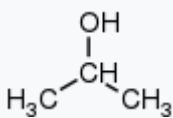
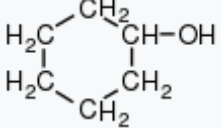
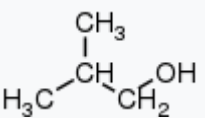
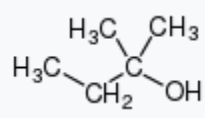
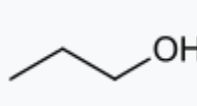
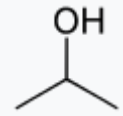
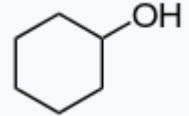
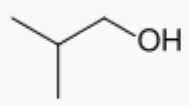
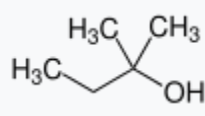
$\text{2CH}_2\text{OH}$

2OH , propan-2-ol for $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$

$\text{3CH}(\text{OH})\text{CH}_3$

If a higher priority group is present (such as an aldehyde, ketone, or carboxylic acid), then the prefix hydroxy- is used, [17] e.g., as in 1-hydroxy-2-propanone ($\text{CH}_3\text{C}(\text{O})\text{CH}_2\text{OH}$)

Some examples of simple alcohols and how to name them

$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH}$				
				
<i>n</i>-propyl alcohol, propan-1-ol, or 1-propanol	isopropyl alcohol, propan-2-ol, or 2-propanol	cyclohexanol	isobutyl alcohol, 2-methylpropan-1-ol, or 2-methyl-1-propanol	<i>tert</i>-amyl alcohol, 2-methylbutan-2-ol, or 2-methyl-2-butanol
A primary alcohol	A secondary alcohol	A secondary alcohol	A primary alcohol	A tertiary alcohol

(IUPAC, [Compendium of Chemical Terminology](#), 2006)

In cases where the OH functional group is bonded to an sp² carbon on an aromatic ring the molecule is known as a phenol, and is named using the IUPAC rules for naming phenols.

3.6 Drug Use

If we are to understand why and how people use drugs we need to look at three key factors. These are:

- Your personality
- The type of drug you take, and
- The context of your drug use

These factors are connected and can't be separated. They influence your reasons for using a drug and the effects it will have on you. We need to understand that there are different levels of drug use with different types of problems.

You can move between the different levels, for example if you start using more heavily, but you can also stop taking drugs and then start the cycle again. While you may think that drug use will always lead to drug abuse, this is not always the case. Drug use is not the same as drug abuse.

Radon in basements, lead in drinking water, exhausts from cars and chemicals released from landfills are just a few examples of toxic substances that can hurt you. By understanding how, you can reduce your exposure to chemicals and reduce your risk of harmful health effects.

3.7 Toxic Substance

A toxic substance is a substance that can be poisonous or cause health effects. People are generally concerned about chemicals like polychlorinated biphenyls (PCBs) and dioxin which can be found at some hazardous waste sites. Products that we use daily, such as household cleaners, prescription and over-the-counter drugs, gasoline, alcohol, pesticides, fuel oil and cosmetics, can also be toxic. Any chemical can be toxic or harmful under certain conditions.

Chemicals can be toxic because they can harm us when they enter or contact the body. Exposure to a toxic substance such as gasoline can affect your health. Since drinking gasoline can cause burns, vomiting, diarrhea and, in very large amounts, drowsiness or death, it is toxic. Some chemicals are hazardous because of their physical properties: they can explode, burn or react easily with other chemicals. Since gasoline can burn and its vapors can explode, gasoline is also hazardous. A chemical can be toxic, or hazardous, or both.

Since chemicals can be toxic, it is important to understand how they can affect health. To determine the risk of harmful health effects from a substance, you must first know how toxic the substance is; how much, and by what means, a person is exposed; and how sensitive that person is to the substance. Some substances are more toxic than others. The toxicity of a substance is described by the types of effects it causes and its potency.

3.7 Stages of Drug Use

3.7.1 Experimental use

Most young people try drugs for the first time as an experiment, usually because their friends are doing it. It tends not to last long and will not happen often. It depends on many factors such as: how easy it is to get drugs, where it's happening, your group of friends, and current trends or fashion. You may go on to recreational drug use or you may stop once you have satisfied your curiosity. The main risk of this type of drug use is that young people may not know about the effects of the drugs they try.

3.7.2 Recreational drug use

Some people continue to use drugs in order to have fun. This is usually a regular thing, such as every weekend, and is part of your social life. You may feel that you have control over your use of drugs. Even if you use a lot, you may not be addicted to the drug. This type of drug use only applies to certain drugs and contexts, for example ecstasy and dance culture. Most people who take recreational drugs see it as a ‘normal’ activity in their social circle.

3.7.3 Dependent drug use

If you use drugs for a long time or use them heavily, you may no longer be able to control your use. This is called dependence or addiction and may be physical or psychological. Physical dependence means that your body craves the drug. Psychological dependence is when you feel that you can't cope without it. This level of drug use usually happens on your own or in a small group. As well as making you sick, it often causes emotional, psychological and social problems.

3.7.4 Abstainers

An abstainer is someone who does not take any drugs or someone who has been off drugs for a long time and does not want to use them again.

3.8 X-RAYS and VDTS

X-rays make up X-radiation, a form of electromagnetic radiation. Most X-rays have a wavelength ranging from 0.01 to 10 nanometers, corresponding to frequencies in the range 30 petahertz to 30 exahertz (3×10^{16} Hz to 3×10^{19} Hz) and energies in the range 100 eV to 100 keV. X-ray wavelengths are shorter than those of UV rays and typically longer than those of gamma rays. In many languages, X-radiation is referred to with terms meaning Röntgen radiation, after the German scientist Wilhelm Röntgen who discovered these on November 8, 1895,[1] who usually is credited as its discoverer, and who named it X-radiation to signify an unknown type of radiation.[2]Spelling of X-ray(s) in the English language includes the variants x-ray(s), xray(s), and X ray(s).

4.0 CONCLUSION

Students had learnt about the relationship between pregnancy and diet, toxic substances and the stages of drugs.

5.0 SUMMARY

Chemicals can be toxic because they can harm us when they enter or contact the body. Exposure to a toxic substance such as gasoline can affect your health. Since drinking gasoline can cause burns, vomiting, diarrhea and, in very large amounts, drowsiness or death, it is toxic. Some chemicals are hazardous because of their physical properties: they can explode, burn or react easily with other chemicals. Since gasoline can burn and its vapors can explode, gasoline is also hazardous. A chemical can be toxic, or hazardous, or both.

Since chemicals can be toxic, it is important to understand how they can affect health. To determine the risk of harmful health effects from a substance, you must first know how toxic the substance is; how much, and by what means, a person is exposed; and how sensitive that person is to the substance.

6.0 TUTOR-MARKED ASSIGNMENT

1. State the relationship between pregnancy and diet
2. What are toxic substances?

Solution

1. Pregnancy is a dynamic, anabolic state. Within several weeks of conception, a new endocrine organ, the placenta, is already formed and is secreting hormones that affect the metabolism of all nutrients. These adjustments in nutrient metabolism, in addition to changes in the anatomy and physiology of the mother, support fetal growth and development while maintaining maternal homeostasis and preparing for lactation. Depending on the nutrient, one or more of the following adjustments occur: 1) accretion in new tissue or deposition in maternal stores, 2) redistribution among tissues, and 3) increased turnover or rate of metabolism.

To support these adjustments, the use of nutrients from the diet may be altered either by increasing intestinal absorption or by reducing excretion via the kidney or gastrointestinal tract. These adjustments

in nutrient metabolism are complex and evolve continuously throughout pregnancy. The changes in nutrient metabolism can be described by several general concepts: adjustments in nutrient metabolism are driven by hormonal changes, fetal demands, and maternal nutrient supply; more than one potential adjustment exists for each nutrient.

2. A toxic substance is a substance that can be poisonous or cause health effects. People are generally concerned about chemicals like polychlorinated biphenyls (PCBs) and dioxin which can be found at some hazardous waste sites. Products that we use daily, such as household cleaners, prescription and over-the-counter drugs, gasoline, alcohol, pesticides, fuel oil and cosmetics, can also be toxic. Any chemical can be toxic or harmful under certain conditions.

7.0 REFERENCES/FURTHER READING

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UNIT 2 HUMAN IMMUNODEFICIENCY VIRUS INFECTION AND ACQUIRED IMMUNE DEFICIENCY SYNDROME (HIV/AIDS)

CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main content
 - 3.1 Meaning of Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome (HIV/AIDS)
 - 3.1.1 Sexually Transmitted Diseases (STDs)
 - 3.2 Rubella
 - 3.3 Autoimmunity
 - 3.3.1 Low level autoimmunity
 - 3.3.2 Immunological tolerance
 - 3.4 Diabetes
 - 3.5 Hypertension
 - 3.6 Tumors/ Neoplasm
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor- Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

Human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) is a spectrum of conditions caused by infection with the human immunodeficiency virus (HIV).

2.0 OBJECTIVES

At the end of this unit, students should be able to:

1. Explain Human immunodeficiency virus infection and acquired immune deficiency syndrome

3.0 MAIN CONTENTS

3.1 Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome (HIV/AIDS)

Human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) is a spectrum of conditions caused by infection with the human immunodeficiency virus (HIV). Following initial infection, a person may not notice any symptoms or may experience a brief period of influenza-like illness. Typically, this is followed by a prolonged period with no symptoms. As the infection progresses, it interferes more with the immune system, increasing the risk of developing common infections such as tuberculosis, as well as other opportunistic infections, and tumors that rarely affect people who have uncompromised immune systems. These late symptoms of infection are referred to as acquired immunodeficiency syndrome (AIDS). This stage is often also associated with unintended weight loss.

HIV is spread primarily by unprotected sex (including anal and oral sex), contaminated blood transfusions, hypodermic needles, and from mother to child during pregnancy, delivery, or breastfeeding. Some bodily fluids, such as saliva and tears, do not transmit HIV. Methods of prevention include safe sex, needle exchange programs, treating those who are infected, pre- and post-exposure prophylaxis, and male circumcision. Disease in a baby can often be prevented by giving both the mother and child antiretroviral medication. There is no cure or vaccine; however, antiretroviral treatment can slow the course of the disease and may lead to a near-normal life expectancy. Treatment is recommended as soon as the diagnosis is made. Without treatment, the average survival time after infection is 11 years.

3.1.1 Sexually Transmitted Diseases (STDs)

Sexually transmitted infections (STIs), also referred to as sexually transmitted diseases (STDs), are infections that are commonly spread by sexual activity, especially vaginal intercourse, anal sex and oral sex. Many times STIs initially do not cause symptoms. This results in a greater risk of passing the disease on to others. Symptoms and signs of disease may include vaginal discharge, penile discharge, ulcers on or around the genitals, and pelvic pain. STIs can be transmitted to an infant before or during childbirth and may result in poor outcomes for the baby. Some STIs may cause problems with the ability to get pregnant.

More than 30 different bacteria, viruses, and parasites can be transmitted through sexual activity. Bacterial STIs include chlamydia, gonorrhea, and syphilis. Viral STIs include genital herpes, HIV/AIDS, and genital warts. Parasitic STIs include trichomoniasis. While usually spread by sex, some STIs can be spread by non-sexual contact with donor tissue, blood, breastfeeding, or during childbirth. STI diagnostic tests are usually easily available in the developed world, but this is often not the case in the developing world.

The most effective way of preventing STIs is by not having sex. Some vaccinations may also decrease the risk of certain infections including hepatitis B and some types of HPV. Safer sex practices such as use of condoms, having a smaller number of sexual partners, and being in a relationship where each person only has sex with the other also decreases the risk. Circumcision in males may be effective to prevent some infections. During school, comprehensive sex education may also be useful. Most STIs are treatable or curable. Of the most common infections, syphilis, gonorrhea, chlamydia, and trichomoniasis are curable, while herpes, hepatitis B, HIV/AIDS, and HPV are treatable but not curable. Resistance to certain antibiotics is developing among some organisms such as gonorrhea.

In 2015, about 1.1 billion people had STIs other than HIV/AIDS. [3] About 500 million were infected with either syphilis, gonorrhea, chlamydia or trichomoniasis. At least an additional 530 million people have genital herpes and 290 million women have human papillomavirus. STIs other than HIV resulted in 108,000 deaths in 2015. In the United States there were 19 million new cases of sexually transmitted infections in 2010. Historical documentation of STIs date back to at least the Ebers papyrus around 1550 BC and the Old Testament. There is often shame and stigma associated with these infections. The term sexually transmitted infection is generally preferred over sexually transmitted disease or venereal disease, as it includes those who do not have symptomatic disease.

3.2 Rubella

Rubella, also known as German measles or three-day measles, is an infection caused by the rubella virus. This disease is often mild with half of people not realizing that they are infected. A rash may start around two weeks after exposure and last for three days. It usually starts on the face and spreads to the rest of the body. The rash is sometimes itchy and is not as bright as that of measles. Swollen lymph nodes are common and may last a few weeks. A fever, sore throat, and fatigue may also occur. In adult's joint

pain is common. Complications may include bleeding problems, testicular swelling, and inflammation of nerves. Infection during early pregnancy may result in a child born with congenital rubella syndrome (CRS) or miscarriage. Symptoms of CRS include problems with the eyes such as cataracts, ears such as deafness, heart, and brain. Problems are rare after the 20th week of pregnancy.

Rubella is usually spread through the air via coughs of people who are infected. People are infectious during the week before and after the appearance of the rash. Babies with CRS may spread the virus for more than a year. Only humans are infected. Insects do not spread the disease. Once recovered, people are immune to future infections. Testing is available that can verify immunity. Diagnosis is confirmed by finding the virus in the blood, throat, or urine. Testing the blood for antibodies may also be useful.

Rubella is preventable with the rubella vaccine with a single dose being more than 95% effective. Often it is given in combination with the measles vaccine and mumps vaccine, known as the MMR vaccine. When some, but less than 80%, of a population is vaccinated, more women may reach childbearing age without developing immunity by infection or vaccination, thus possibly raising CRS rates. Once infected there is no specific treatment.

Rubella is a common infection in many areas of the world. Each year about 100,000 cases of congenital rubella syndrome occur. Rates of disease have decreased in many areas as a result of vaccination. There are ongoing efforts to eliminate the disease globally. In April 2015 the World Health Organization declared the Americas free of rubella transmission. The name "rubella" is from Latin and means little red. It was first described as a separate disease by German physicians in 1814 resulting in the name "German measles

3.3 Autoimmunity

Autoimmunity is the system of immune responses of an organism against its own healthy cells and tissues. Any disease that results from such an aberrant immune response is termed an "autoimmune disease". Prominent examples include celiac disease, diabetes mellitus type 1, sarcoidosis, systemic lupus erythematosus (SLE), and multiple sclerosis (MS). Autoimmune diseases are very often treated with steroids in the later 19th century it was believed that the immune system was unable to react against the body's own tissues. Paul Ehrlich, at the turn of the 20th century,

proposed the concept of *horror autotoxicus*. Ehrlich later adjusted his theory to recognize the possibility of autoimmune tissue attacks, but believed certain innate protection mechanisms would prevent the autoimmune response from becoming pathological.

In 1904 this theory was challenged by the discovery of a substance in the serum of patients with paroxysmal cold hemoglobinuria that reacted with red blood cells. During the following decades, a number of conditions could be linked to autoimmune responses. However, the authoritative status of Ehrlich's postulate hampered the understanding of these findings. Immunology became a biochemical rather than a clinical discipline. By the 1950s the modern understanding of autoantibodies and autoimmune diseases started to spread.

More recently it has become accepted that autoimmune responses are an integral part of vertebrate immune systems (sometimes termed "natural autoimmunity"). Autoimmunity should not be confused with alloimmunity.

3.3.1 Low level autoimmunity

While a high level of autoimmunity is unhealthy, a low level of autoimmunity may actually be beneficial. Taking the experience of a beneficial factor in autoimmunity further, one might hypothesize with intent to prove that autoimmunity is always a self-defense mechanism of the mammal system to survive. The system does not randomly lose the ability to distinguish between self and non-self, the attack on cells may be the consequence of cycling metabolic processes necessary to keep the blood chemistry in homeostasis.

Second, autoimmunity may have a role in allowing a rapid immune response in the early stages of an infection when the availability of foreign antigens limits the response (i.e., when there are few pathogens present).

3.3.2 Immunological tolerance

Pioneering work by Noel Rose and Ernst Witebsky in New York, and Roitt and Doniach at University College London provided clear evidence that, at least in terms of antibody-producing B cells (B lymphocytes), diseases such as rheumatoid arthritis and thyrotoxicosis are associated with loss of immunological tolerance, which is the ability of an individual to ignore "self", while reacting to "non-self". This breakage leads to the immune system's mounting an effective and specific immune response against self-determinants.

3.4 Diabetes

Diabetes mellitus (DM), commonly known as diabetes, is a group of metabolic disorders characterized by high blood sugar levels over a prolonged period.[10]Symptoms of high blood sugar include frequent urination, increased thirst, and increased hunger.[2] If left untreated, diabetes can cause many complications.[2]Acute complications can include diabetic ketoacidosis, hyperosmolar hyperglycemic state, or death.[3] Serious long-term complications include cardiovascular disease, stroke, chronic kidney disease, foot ulcers, and damage to the eyes.

Diabetes is due to either the pancreas not producing enough insulin, or the cells of the body not responding properly to the insulin produced. There are three main types of diabetes mellitus:

- Type 1 diabetes results from the pancreas's failure to produce enough insulin due to loss of beta cells. This form was previously referred to as "insulin-dependent diabetes mellitus" (IDDM) or "juvenile diabetes". The cause is unknown.
- Type 2 diabetes begins with insulin resistance, a condition in which cells fail to respond to insulin properly. As the disease progresses, a lack of insulin may also develop. This form was previously referred to as "non-insulin-dependent diabetes mellitus" (NIDDM) or "adult-onset diabetes". The most common cause is a combination of excessive body weight and insufficient exercise.
- Gestational diabetes is the third main form, and occurs when pregnant women without a previous history of diabetes develop high blood sugar levels.

Prevention and treatment involve maintaining a healthy diet, regular physical exercise, a normal body weight, and avoiding use of tobacco. Control of blood pressure and maintaining proper foot care are important for people with the disease. Type 1 diabetes must be managed with insulin injections. Type 2 diabetes may be treated with medications with or without insulin. Insulin and some oral medications can cause low blood sugar. Weight loss surgery in those with obesity is sometimes an effective measure in those with type 2 diabetes. Gestational diabetes usually resolves after the birth of the baby.

3.5 Hypertension

Hypertension (HTN or HT), also known as high blood pressure (HBP), is a long-term medical condition in which the blood pressure in the arteries is

persistently elevated. High blood pressure typically does not cause symptoms. Long-term high blood pressure, however, is a major risk factor for coronary artery disease, stroke, heart failure, atrial fibrillation, peripheral vascular disease, vision loss, chronic kidney disease, and dementia.

High blood pressure is classified as either primary (essential) high blood pressure or secondary high blood pressure. About 90–95% of cases are primary, defined as high blood pressure due to nonspecific lifestyle and genetic factors. Lifestyle factors that increase the risk include excess salt in the diet, excess body weight, smoking, and alcohol use. The remaining 5–10% of cases are categorized as secondary high blood pressure, defined as high blood pressure due to an identifiable cause, such as chronic kidney disease, narrowing of the kidney arteries, an endocrine disorder, or the use of birth control pills.

Blood pressure is expressed by two measurements, the systolic and diastolic pressures, which are the maximum and minimum pressures, respectively. For most adults, normal blood pressure at rest is within the range of 100–130 millimeters mercury (mmHg) systolic and 60–80 mmHg diastolic. For most adults, high blood pressure is present if the resting blood pressure is persistently at or above 130/80 or 140/90 mmHg. Different numbers apply to children. Ambulatory blood pressure monitoring over a 24-hour period appears more accurate than office-based blood pressure measurement.

3.6 Tumors/ Neoplasm

A neoplasm is a type of abnormal and excessive growth, called neoplasia, of tissue. The growth of a neoplasm is uncoordinated with that of the normal surrounding tissue, and it persists growing abnormally, even if the original trigger is removed. This abnormal growth usually (but not always) forms a mass. When it forms a mass, it may be called a tumor.

ICD-10 classifies neoplasms into four main groups: benign neoplasms, in situ neoplasms, malignant neoplasms, and neoplasms of uncertain or unknown behavior. Malignant neoplasms are also simply known as cancers and are the focus of oncology.

Prior to the abnormal growth of tissue, as neoplasia, cells often undergo an abnormal pattern of growth, such as metaplasia or dysplasia. However, metaplasia or dysplasia does not always progress to neoplasia. The word is

from Ancient Greek νέος- neo ("new") and πλάσμα plasma ("formation", "creation").

4.0 CONCLUSION

Students had learnt about Human immunodeficiency virus infection and acquired immune deficiency syndrome and genetic abnormality

5.0 SUMMARY

Rubella is a common infection in many areas of the world. Each year about 100,000 cases of congenital rubella syndrome occur. Rates of disease have decreased in many areas as a result of vaccination. There are ongoing efforts to eliminate the disease globally. In April 2015 the World Health Organization declared the Americas free of rubella transmission. The name "rubella" is from Latin and means little red. It was first described as a separate disease by German physicians in 1814 resulting in the name "German measles

6.0 TUTOR-MARKED ASSIGNMENTS

What is Human immunodeficiency virus infection and acquired immune deficiency syndrome,

Solution

Human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) is a spectrum of conditions caused by infection with the human immunodeficiency virus (HIV). Following initial infection, a person may not notice any symptoms or may experience a brief period of influenza-like illness. Typically, this is followed by a prolonged period with no symptoms. As the infection progresses, it interferes more with the immune system, increasing the risk of developing common infections such as tuberculosis, as well as other opportunistic infections, and tumors that rarely affect people who have uncompromised immune systems. These late symptoms of infection are referred to as acquired immunodeficiency syndrome (AIDS). This stage is often also associated with unintended weight loss.

HIV is spread primarily by unprotected sex (including anal and oral sex), contaminated blood transfusions, hypodermic needles, and from mother to child during pregnancy, delivery, or breastfeeding. Some bodily fluids, such as saliva and tears, do not transmit HIV. Methods of prevention

include safe sex, needle exchange programs, treating those who are infected, pre- and post-exposure prophylaxis, and male circumcision. Disease in a baby can often be prevented by giving both the mother and child antiretroviral medication.

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UNIT 3 KIDNEY DISEASES AND GENETIC ABNORMALITY

CONTENT

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Contents
 - 3.1 Kidney Diseases
 - 3.2 Genetic Abnormality
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignments
- 7.0 References/Further Reading

1.0 INTRODUCTION

Having certain diseases puts people at higher risk of kidney disease

2.0 OBJECTIVES

At the end of this unit, students should be able to:

1. Explain Some kidney diseases
2. What is genetic abnormality

3.0 MAIN CONTENTS

3.1 Kidney Diseases

Having certain diseases puts people at higher risk of kidney disease. These include:

- Diabetes
- High blood pressure
- Systemic lupus erythematosus (a connective tissue disease)
- Sickle cell anemia
- Cancer
- AIDS
- Hepatitis C
- Congestive heart failure

Having a kidney disease can make it feel as if your life has spun out of control. But, knowledge really is power. The things we worry about when we don't know what to expect can be far worse than what may really happen. Learning about your kidneys is a way to feel more in control of your life and health again.

The main job of kidneys is to help keep your body chemistry in balance all the time. To do this, kidneys:

- **Make Urine.** Your kidneys make urine to get rid of wastes and extra water. Wastes come from some foods, breaking down medicines, and even just moving your muscles.
- **Balance Minerals.** Your muscles, blood vessels, nerves, and bones need precise amounts of minerals in your blood all the time. Kidneys sense the levels of minerals in your blood. They hold onto what you need and send the rest to your bladder, as urine.
- **Control Your Blood Pressure.** Kidneys keep water and salt(s) in balance in your blood. And, they make an enzyme (renin) that helps your blood vessels tense up to raise your blood pressure if it drops too low. High blood pressure can harm kidneys and causes KD. Or, CKD can cause high blood pressure. Like the chicken and the egg, it can be hard to tell which came first.
- **Help You Make Red Blood Cells.** Each cell in your body needs oxygen to live, and red blood cells bring it. If you have too few red blood cells (anemia), your kidneys send out a hormone (erythropoietin, or EPO). EPO tells your bone marrow to make more red blood cells. Kidneys that don't work well make less EPO.
- **Keep Your Bones Strong.** You need the right level of calcium in your blood all the time to live. Your bones are a "storage bank" for calcium and phosphorus. When you need more blood calcium, the kidneys send out a hormone. Active vitamin D is a hormone that lets your gut absorb calcium from foods. If the hormone signal does not work, your body will pull calcium out of your bones, which can make them weak and more likely to break.

3.1.1 Hepatitis

Hepatitis is an inflammation of the liver. The condition can be self-limiting or can progress to fibrosis (scarring), cirrhosis or liver cancer. Hepatitis viruses are the most common cause of hepatitis in the world but other infections, toxic substances (e.g. alcohol, certain drugs), and autoimmune diseases can also cause hepatitis.

There are 5 main hepatitis viruses, referred to as types A, B, C, D and E. These 5 types are of greatest concern because of the burden of illness and death they cause and the potential for outbreaks and epidemic spread. In particular, types B and C lead to chronic disease in hundreds of millions of people and, together, are the most common cause of liver cirrhosis and cancer.

Hepatitis A and E are typically caused by ingestion of contaminated food or water. Hepatitis B, C and D usually occur as a result of parenteral contact with infected body fluids. Common modes of transmission for these viruses include receipt of contaminated blood or blood products, invasive medical procedures using contaminated equipment and for hepatitis B transmission from mother to baby at birth, from family member to child, and also by sexual contact.

Acute infection may occur with limited or no symptoms, or may include symptoms such as jaundice (yellowing of the skin and eyes), dark urine, extreme fatigue, nausea, vomiting and abdominal pain.

3.1.2 Anaemia

Anaemia is a deficiency in the number or quality of red blood cells in your body. Red blood cells carry oxygen around your body using a particular protein called haemoglobin. Anaemia means that either the level of red blood cells or the level of haemoglobin is lower than normal. When a person has anaemia, their heart has to work harder to pump the quantity of blood needed to get enough oxygen around their body. During heavy exercise, the cells may not be able to carry enough oxygen to meet the body's needs and the person can become exhausted and feel unwell. Anaemia isn't a disease in itself, but a result of a malfunction somewhere in the body. This blood condition is common, particularly in females. Some estimates suggest that around one in five menstruating women and half of all pregnant women are anaemic.

3.1.2.1 Causes of Anaemia

Anaemia can have many causes, including:

- dietary deficiency – lack of iron, vitamin B12 or folic acid in the diet
- malabsorption – where the body is not able to properly absorb or use the nutrients in the diet, caused by conditions such as coeliac disease
- inherited disorders – such as thalassaemia or sickle cell disease

- autoimmune disorders – such as autoimmune haemolytic anaemia, where the immune cells attack the red blood cells and decrease their life span
- chronic diseases – such as diabetes, rheumatoid arthritis and tuberculosis

3.1.2.2 Symptoms of Anaemia

Depending on the severity, the symptoms of anaemia may include:

- pale skin
- fatigue
- weakness
- tiring easily
- breathlessness
- drop in blood pressure when standing from a sitting or lying position (orthostatic hypotension) – this may happen after acute blood loss, like a heavy period
- frequent headaches

3.2 Groups at High Risk of Anaemia

Certain people are at increased risk of anaemia, including:

- menstruating women
- pregnant and breastfeeding women
- babies, especially if premature
- children going through puberty
- people following a vegetarian or vegan diet
- people with cancer, stomach ulcers and some chronic diseases
- people on fad diets
- athletes.

3.3 Genetic Abnormalities

A genetic disorder is a genetic problem caused by one or more abnormalities formed in the genome. Most genetic disorders are quite rare and affect one person in every several thousands or millions. The earliest known genetic condition in a hominid was in the fossil species *Paranthropus robustus*, with over a third of individuals displaying *Amelogenesis imperfecta*.

Genetic disorders may be hereditary, meaning that they are passed down from the parents' genes. In other genetic disorders, defects may be caused by new mutations or changes to the DNA. In such cases, the defect will only be passed down if it occurs in the germline.

Some types of recessive gene disorders confer an advantage in certain environments when only one copy of the gene is present.

A single-gene (or monogenic) disorder is the result of a single mutated gene. Over 6000 human diseases are caused by single-gene defects. Single-gene disorders can be passed on to subsequent generations in several ways. Genomic imprinting and uniparental disomy, however, may affect inheritance patterns. The divisions between recessive and dominant types are not "hard and fast", although the divisions between autosomal and X-linked types are (since the latter types are distinguished purely based on the chromosomal location of the gene). For example, achondroplasia is typically considered as a dominant disorder, but children with two genes for achondroplasia have a severe skeletal disorder of which achondroplasics could be viewed as carriers. Sickle-cell anemia is also considered as a recessive condition, but heterozygous carriers have increased resistance to malaria in early childhood, which could be described as a related dominant condition. When a couple where one partner or both are sufferers or carriers of a single-gene disorder wish to have a child, they can do so through in vitro fertilization, which enables preimplantation genetic diagnosis to occur to check whether the embryo has the genetic disorder.

3.3.1 Autosomal Dominant

Only one mutated copy of the gene will be necessary for a person to be affected by an autosomal dominant disorder. Each affected person usually has one affected parent. The chance a child will inherit the mutated gene is 50%. Autosomal dominant conditions sometimes have reduced penetrance, which means although only one mutated copy is needed, not all individuals who inherit that mutation go on to develop the disease. Examples of this type of disorder are Huntington's disease, neurofibromatosis type 1, neurofibromatosis type 2, Marfan syndrome, hereditary nonpolyposis colorectal cancer, hereditary multiple exostoses (a highly penetrant autosomal dominant disorder), Tuberous sclerosis, Von Willebrand disease, and acute intermittent porphyria. Birth defects are also called congenital anomalies.

3.3.2 Autosomal Recessive

Two copies of the gene must be mutated for a person to be affected by an autosomal recessive disorder. An affected person usually has unaffected parents who each carry a single copy of the mutated gene (and are referred to as carriers). Two unaffected people who each carry one copy of the mutated gene have a 25% risk with each pregnancy of having a child affected by the disorder. Examples of this type of disorder are Albinism, Medium-chain acyl-CoA dehydrogenase deficiency, cystic fibrosis, sickle-cell disease, Tay–Sachs disease, Niemann-Pick disease, spinal muscular atrophy, and Roberts syndrome. Certain other phenotypes, such as wet versus dry earwax, are also determined in an autosomal recessive fashion.

3.3.3 Blood Group Incompatibility

Blood types are categorized by A, B, and O, and given an Rh factor of positive or negative. A-B-O and Rh incompatibility happens when a mother's blood type conflicts with that of her newborn child. It is possible for a mother's red blood cells to cross into the placenta or fetus during pregnancy. When this occurs, the mother's blood cells develop antibodies that can attack the newborn's blood cells and cause jaundice. The risk of this is highest near or during delivery.

A-B-O incompatibility occurs when:

- the mother is type O and the baby is B, A, or AB
- the mother is type A and their baby is B or AB
- the mother is type B and their baby is A or AB

Rh incompatibility occurs when a mother has Rh-negative blood and the baby has Rh-positive blood. The mother's body will produce an auto-immune response that attacks the fetus or newborn's blood cells as if they were a bacterial or viral invader. This immune response is fairly slow to develop and is rarely a serious issue in first pregnancies. However, subsequent pregnancies with an Rh incompatibility are a significantly higher risk.

Blood type incompatibility can be prevented with a blood test early in pregnancy. If an Rh incompatibility is found, an Rh-immune globulin treatment is administered about 28 weeks into the pregnancy. If the incompatibility is not detected, the newborn can develop severe jaundice leading to brain damage. While it can have serious consequences, jaundice in newborns is common and treatable; medical attention is necessary at the

first sign of yellowish discoloration in the skin or eyes. Rh and ABO incompatibility in the infant results in jaundice, which is treated through hydration and phototherapy. Biliblankets and other phototherapy equipment help the infant's body expel bilirubin, the cause of jaundice.

4.0 CONCLUSION

Students had learnt about kidney diseases and genetic abnormalities

5.0 SUMMARY

A single-gene (or monogenic) disorder is the result of a single mutated gene. Over 6000 human diseases are caused by single-gene defects. Single-gene disorders can be passed on to subsequent generations in several ways. Genomic imprinting and uniparental disomy, however, may affect inheritance patterns. The divisions between recessive and dominant types are not "hard and fast", although the divisions between autosomal and X-linked types are (since the latter types are distinguished purely based on the chromosomal location of the gene). For example, achondroplasia is typically considered as a dominant disorder, but children with two genes for achondroplasia have a severe skeletal disorder of which achondroplasics could be viewed as carriers. Sickle-cell anemia is also considered as a recessive condition, but heterozygous carriers have increased resistance to malaria in early childhood, which could be described as a related dominant condition. When a couple where one partner or both are sufferers or carriers of a single-gene disorder wish to have a child, they can do so through in vitro fertilization, which enables preimplantation genetic diagnosis to occur to check whether the embryo has the genetic disorder.

6.0 TUTOR-MARKED ASSIGNMENTS

- 1 What are genetic abnormalities?
- 2 List some kidney diseases and explain them

Solution

1. A genetic disorder is a genetic problem caused by one or more abnormalities formed in the genome. Most genetic disorders are quite rare and affect one person in every several thousands or millions. The earliest known genetic condition in a hominid was in the fossil species *Paranthropus robustus*, with over a third of individuals displaying *Amelogenesis imperfecta*.

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2. Diabetes

- High blood pressure
- Systemic lupus erythematosus (a connective tissue disease)
- Sickle cell anemia
- Cancer
- AIDS
- Hepatitis C
- Congestive heart failure

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